APPENDIX A
OVERVIEW OF THE PUBLIC PARTICIPATION PROCESS

This appendix describes the public comment process for the U.S. Department of Energy's *Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel* and the procedures used to respond to those comments. Section A.1 provides an overview of the public scoping process for the draft environmental impact statement. Section A.2 discusses the process for obtaining public comments on the draft environmental impact statement, including the public hearing format and the major issues raised by the comments received. Section A.2.5 presents oral comments made by attendees at the four public hearings and the U.S. Department of Energy's responses. Section A.2.6 contains scanned copies of comment documents received during the public comment period and the Department's responses to each comment.

A.1 THE PUBLIC SCOPING PROCESS

A.1.1 Scoping Process Description

As a preliminary step in the development of an environmental impact statement (EIS), regulations established by the Council on Environmental Quality (40 CFR 1501.7) and the U.S. Department of Energy (DOE) require "an early and open process for determining the scope of issues to be addressed and for identifying the significant issues related to a proposed action." The purpose of this scoping process is: (1) to inform the public about a proposed action and the alternatives being considered and (2) to identify and/or clarify those issues considered most relevant by the public.

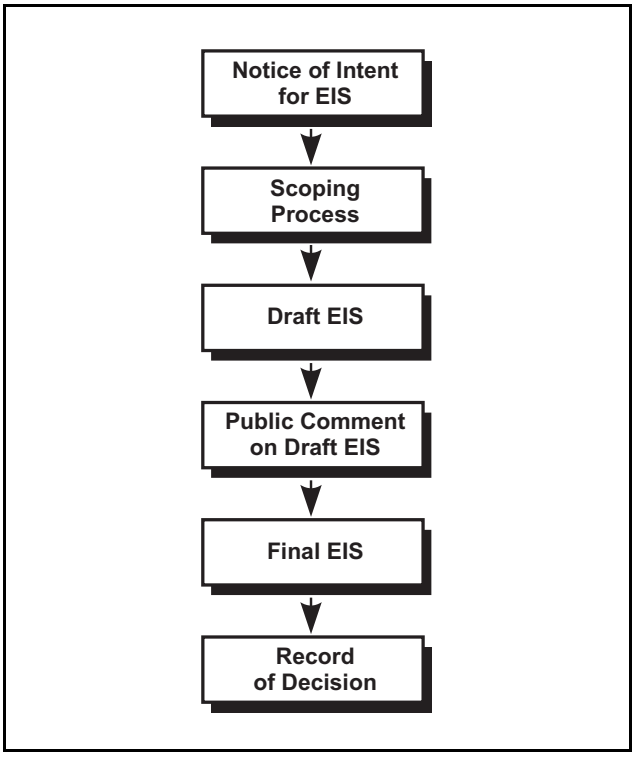

Figure A–1 NEPA Process

On February 22, 1999, DOE published in the *Federal Register* a Notice of Intent to prepare an EIS for the treatment of sodium-bonded spent nuclear fuel. As shown in **Figure A–1**, the scoping process is one of the opportunities for public involvement required as part of the National Environmental Policy Act (NEPA) process. The Notice of Intent listed the alternatives and issues initially identified by DOE for evaluation in the EIS. Members of the public, civic leaders, and other interested parties were invited to comment on these issues and to suggest additional issues that should be considered in the EIS. The Notice of Intent also informed the public that comments on the proposed action could be communicated via U.S. mail, a special DOE web site on the Internet, a toll-free phone line, a toll-free fax line, or in person at one of four public meetings.

Four public scoping meetings were held at locations in Idaho, South Carolina, and Virginia, near the Washington, DC, metropolitan area. The first public meeting was attended by about 60 members of the public and was held in Idaho Falls, Idaho, on March 9, 1999. The second meeting was held in Boise, Idaho,

on March 11, 1999, and was attended by about 7 members of the public. Approximately 10 members of the public attended the third meeting, which was held in North Augusta, South Carolina, on March 15, 1999. The fourth meeting was held in Arlington, Virginia, on March 18, 1999, and was attended by about 8 members of the public.

As a result of previous experience and positive responses from attendees of other DOE/NEPA public meetings and hearings, DOE chose an interactive format for the scoping meetings. Each meeting began with a presentation by a DOE representative who explained the proposed action. Afterwards, an impartial facilitator opened the floor to questions, comments, and concerns from the audience. DOE and national laboratory personnel were available to respond to the questions and comments as needed. A court reporter was provided at each of the meetings to record the oral comments, and personnel were available to receive any written statements or comments that were submitted at the meetings. In addition, the public was encouraged to submit written or verbal comments via letters, the DOE Internet web site, the toll-free phone line, or the toll-free fax line until the end of the scoping period on April 8, 1999 (45 days after publication of the Notice of Intent).

It should be noted that, for EIS public scoping purposes, a comment is defined as a single statement or opinion concerning a specific issue. Any statement may contain many separate comments. Most of the verbal and written public statements submitted during the EIS scoping period contained multiple comments on various individual issues.

A.1.2 Scoping Process Results

Two hundred twenty eight comments were received from citizens, interested groups, and other stakeholders during the public scoping comment period. Of these, 109 were verbal comments made during the public meetings. The remaining comments (119) either were submitted at the public meetings in written form or were received via mail, Internet, fax, or phone during the scoping comment period. In cases where a single commentor provided similar or identical comments both orally at the public meetings and in writing, each individual comment was counted once (i.e., repetitions were not counted).

Many members of the public who spoke at the public meetings asked specific, technical questions about the proposed action that were answered by the DOE and national laboratory representatives at each meeting. Primary areas of interest included:

- Waste volume reduction
- Nature of the spent nuclear fuel waste at Argonne National Laboratory-West (ANL-W)
- Waste forms characterization
- Waste disposition and qualification (repository acceptance criteria)
- Plutonium-uranium extraction (PUREX)
- Use of facilities
- Nonproliferation impacts
- Transportation
- Demonstration project

The comments obtained through the overall public scoping process addressed several key issues. A number of persons commented on the schedule for the EIS. Many said the draft EIS should not be issued for public comment before publication of other reports, such as the Waste Qualification Assessment from the National Research Council; the National Academy of Sciences' Independent Assessment Final Report on the demonstration project; a Nonproliferation Impacts Assessment by the DOE Office of Nonproliferation and National Security; and an independent study of the costs of the proposed action. Several commentors also said this EIS is premature because the demonstration project will not be completed until after the draft EIS is published.

Several commentors asked that the EIS include information about the costs of the proposed action and all of the technology alternatives under consideration. Other commentors stated the public should have an opportunity to comment on DOE's ongoing independent Nonproliferation Impacts Assessment within the same time frame as the draft EIS, or that this EIS should be delayed until the assessment is publicly available. Some suggested the assessment be included in the EIS. A few commentors expressed the opinion that electrometallurgical treatment of spent nuclear fuel is a proliferation-prone technology.

Waste was another issue that was frequently cited. Many waste-related comments included opinions about whether low-enriched uranium, plutonium, noble metals, and other components of the waste stream should be viewed as waste or potentially valuable resources. Several commentors asked that the EIS clarify which specific waste forms would be generated by the treatment processes. Others said the EIS should clarify whether the waste would remain at the Savannah River Site (SRS) after processing or be returned to Idaho if the PUREX process were used. Some commentors argued that the electrometallurgical treatment alternatives would not reduce the volume of waste to be stored in a repository. A few questioned how DOE can ensure the waste will meet the acceptance criteria for a repository when no one knows what those criteria will be—or if there will be any repository at all. A few others recommended that the EIS evaluate the PUREX process before it is shut down to ensure that the waste forms resulting from electrometallurgical treatment are as good as the borosilicate glass that is being prepared for the geologic repository.

Regarding the alternative technologies being evaluated as part of this EIS, the commentors generally agreed that DOE should evaluate in detail all of the alternative technologies that potentially could meet DOE's treatment and management needs—even those that DOE considers less technologically mature. Several commentors expressed the opinion that DOE already has made a technology decision in favor of electrometallurgical treatment, but that other alternative new technologies should not be dismissed because of a lack of knowledge about them. Some asked that the EIS: (1) explain how DOE can consider the PUREX process a reasonable alternative when, historically, it could not handle sodium-bonded spent nuclear fuel, and (2) evaluate whether changes in the PUREX process would be needed to accommodate sodium-bonded spent nuclear fuel. A few commentors suggested the EIS should analyze blanket and driver fuel separately, since they have different chemical and radiological characteristics and different treatments might be warranted.

Comments concerning environment, safety, and health issues were comparatively few, as were comments about transportation safety and security. A spokesman for the Shoshone-Bannock Tribe, which considers the Idaho National Engineering and Environmental Laboratory (INEEL) land to be part of their original territory, expressed confidence that the proposed electrometallurgical treatment process would not impact the land's cultural resources or native species. Other commentors wanted the EIS to explain whether there were any environmental threats associated with continued storage of the spent nuclear fuel in Idaho and the nature of the environmental impacts of all the alternative technologies listed in the Notice of Intent. Transportation-related comments were rare, but reflected some public concern about the safety and security of transporting spent nuclear fuel and other waste products over long distances.

Some commentors simply opposed the proposed action as a waste of money or an example of corporate welfare. Others stated that DOE already has determined its choice of alternatives and is merely engaging in a show process that meets the bare minimum legal requirements.

A.1.3 Comment Disposition and Issue Identification

Comments received during the scoping period were systematically reviewed and evaluated to determine whether the issues raised fell within or outside the scope of the EIS as contemplated in the Notice of Intent (64 FR 8553). Where possible, comments on similar or related topics were grouped under comment categories as a means of summarizing the comments. An attempt was made to avoid duplication in counting the number of comments received; however, comments submitted in both written and verbal form may have

been counted twice in some cases. The comment categories were used to identify specific issues of public concern. After the issues were identified, they were evaluated to determine whether they fell within or outside the scope of the EIS. Some issues were found to be already "in scope," i.e., they were among the EIS issues already identified by DOE for inclusion in the EIS. **Table A–1** lists these issues along with references to the specific EIS sections where each issue is discussed.

Additional issues were added to the scope of the EIS as a result of the public scoping process. These issues are listed in **Table A-2**.

DOE responded to all issues raised during the scoping period. Many of the public issues were not analyzed for a specific reason or were determined to be outside the scope of the EIS. These issues are listed in **Table A–3**. Corresponding responses from DOE also are provided in Table A–3 to explain why each issue was not analyzed.

Table A–1 Issues Already Included in the EIS (In Scope)

Issues	*No. of Comments*	*Draft EIS References*
The EIS should specify what the stable sodium compound technology alternative is and how it is derived	1	Section 2.3
The EIS should explain how the PUREX process, which could not handle sodium-bonded spent nuclear fuel before [in the aluminum-bonded Spent Nuclear Fuel EIS], now is considered an acceptable alternative for the proposed action.	1	Section 2.3.2
DOE says the Savannah River PUREX process will handle the sodium, but more research will be needed to improve the sodium-handling ability of the PUREX process. If research is needed to make the Savannah River PUREX process work for sodium, DOE might as well do research in Idaho in some different process. I'm in favor of Idaho; DOE should be cautious about talking PUREX and sodium-bonded stuff.	2	Section 2.3.2
The EIS should evaluate whether changes in the PUREX process would be needed to accommodate this material. After the plutonium is separated in the PUREX process, the high-level radioactive waste will be essentially no different from what is being handled now—no new ground broken, no new qualifications in materials. The uranium also will be unchanged after it goes through the PUREX process. The same with plutonium; if it goes through the PUREX, you haven't changed the existing process. So people should not get excited about this new stuff coming in—we've handled it for fifty years.	2	Sections 2.3.2 and 2.5.4
The EIS should analyze blanket and driver fuel separately since they have different chemical and radiological characteristics and different treatments might be warranted for each.	6	Sections 2.5, 4.3, 4.4, 4.5, 4.6, 4.7, and 4.8.
We're glad to see the melt and dilute alternative, a nonseparation technology, is being considered in this EIS.	1	Sections 2.5.5, 4.6, 4.7, and 4.8
The EIS should not assume that everything is known about the C-22 canister's performance in all conditions that could affect disposal; therefore, this canister should not be the only type of containment considered for encapsulation.	1	Section 4.13
The EIS should clarify whether, if the PUREX process were used, the waste would remain at the Savannah River Site after processing or be returned to Idaho.	4	Section 4.5.6
The EIS must clarify whether DOE considers low-enriched uranium to be a waste.	1	Section 4.3
The EIS must clarify which specific waste form will be used before any spent nuclear fuel is treated.	2	Sections 4.2.6, 4.3.6, 4.4.6, 4.5.6, 4.7.6, and 4.8.6
Will all of the technology alternatives shown on the poster handout be evaluated in this EIS? Has DOE made the ultimate decision concerning which alternatives will be evaluated in this EIS?	1	Section 2.5
Is there anything different about handling the materials involved in this EIS that would make the chloride volatility alternative more viable than was found for aluminum enriched uranium fuel? Hasn't this alternative already been evaluated in another EIS?	1	Section 2.7
The chemistry of the electrometallurgical process and the other alternatives should be provided.	1	Appendix C

Issues	*No. of Comments*	*Draft EIS References*
Blanket fuel can be mechanically declad and stripped of elemental sodium without the need for dissolution and separation of the solid fuel. While the minimal discussion in DOE documents stresses the difficulties of this approach, it is extremely hard to believe that the difficulties, costs, and risks of such minimal processing would be greater than those incurred by electrometallurgical treatment of the fuel. It is difficult to understand DOE's argument that this option is not as mature as electrometallurgical treatment, since it was employed for 15 times as many blanket rods as those that ultimately will be processed during the electrometallurgical treatment demonstration.	1	Section 2.5.3
Both DOE and the U.S. Nuclear Regulatory Commission underplay the significance of the mechanical decladding of 17 metric tons of heavy metal of blanket fuel. The U.S. Nuclear Regulatory Commission refers to this as a small amount even though it is 75 percent of the existing Experimental Breeder Reactor-II (EBR-II) blanket inventory. This is only one example of the loaded language in the Notice of Intent and its reference documents that strongly suggests the mechanical decladding alternative is not being fairly evaluated.	1	Section 2.5.3
All alternatives investigated and considered in this EIS should be viable and demonstrable. Unproven technologies preclude realistic bounding of environmental impacts and consequently do not appear to meet the intent of NEPA by providing implementable alternatives.	1	Section 2.5
Coordinate development of this EIS with others that are currently in preparation, including the Idaho High-Level Waste and Facilities Disposition, the Savannah River Spent Fuel, and the Yucca Mountain EISs.	3	Section 1.6
What are the plans for treatment of sodium-based fuel located at the other sites (about 2 percent of inventory)?	1	Section 2.2
Political decisions, such as the Idaho Settlement Agreement (which says that spent nuclear fuel must be out of Idaho by 2035), should not preclude any of the No Action Alternatives from being considered.	1	Sections 2.5.1, 4.2, and 4.13
I was pleased to hear you say you were looking at several options connected to the No Action [alternative].	1	Sections 2.5.1 and 4.2
The EIS should be specific about the stable compound of sodium and how that makes it like table salt (i.e., not a problem).	1	Appendix C and Section 2.3
How does this EIS relate to other EISs for treatment and disposal of other spent nuclear fuel types?	1	Section 1.6
What is the enrichment of the uranium?	1	Section 2.2.1
DOE should consider whether adequate information exists to allow estimation of bounding impacts for at least one treatment alternative in addition to the PUREX process at the Savannah River Site, the proposed electrometallurgical treatment at ANL-W, and the No Action Alternative. Instead of dismissing various treatment alternatives from further analysis, DOE should use existing information about those alternatives to support evaluation of as many treatment alternatives as possible. For example, the processing experience at Idaho Nuclear Technology and Engineering Center (INTEC) of the driver fuel using the PUREX-type process might be used in the analysis of the PUREX process at Savannah River.	1	Sections 2.5.3, 2.5.5, 4.4, 4.6, 4.7, and 4.8

Issues	*No. of Comments*	*Draft EIS References*
To support public review of the alternatives under consideration, the EIS should offer complete descriptions of how each alternative would be implemented.	1	Appendix C and Section 2.3
Each alternative should include full descriptions of all materials (including waste) resulting from treatment; proposed handling of all materials used in the treatment process; environmental impacts; measures to provide environmental protection; measures to ensure worker and public safety; facilities needed; full and complete discussion of waste handling facilities, magnitude and characteristics of the waste streams, type and amount of storage, and ultimate disposal method and location.	1	Sections 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, and 4.8
The EIS should provide bounding estimates of the size, frequency, and number of expected shipments of products leaving Idaho on an annual basis.	1	Section 4.11
The EIS should provide bounding estimates of the duration of time that INEEL would store any products before shipment elsewhere after treatment.	1	Sections 4.2.6, 4.3.6, 4.6, 5.6, 7.1, and 8.0
Preparation of the EIS and the related decision-making process should be coordinated with related environmental documentation being prepared to ensure they are based on common data and common planning assumptions.	1	Section 1.6
The EIS should deal with disposition of all the waste streams resulting from this proposed action.	2	Sections 2.8, 4.2.6, 4.3.6, 4.4.6, 4.5.6, 4.6.6, 4.7.6, and 4.8.6
To help the public understand DOE's rationale for moving forward with this decision, the EIS should describe how each treatment alternative would address the waste acceptance criteria for resulting waste products destined for disposal at current and planned disposal facilities.	1	Sections 2.8 and 4.13
The draft EIS should include a complete subject index and not just an alphabetically arranged list of headings.	1	Chapter 9
DOE should coordinate the related projects [e.g., the Idaho High-Level and Facilities EIS; the Management of Savannah River Spent Nuclear Fuel EIS; and the Geological Disposal Repository for Spent Nuclear Fuel and High-Level Waste at Yucca Mountain, Nevada, EIS] to support consistent, coordinated decision-making.	1	Section 1.6

Table A–2 Issues Added to the Scope of the EIS

Issues	*No. of Comments*	*Draft EIS References*
Analyses related to the No Action Alternative should include the environmental consequences of not doing anything...and [this alternative] should not be written off because somebody made a political decision that this stuff will be out of Idaho by 2035.	1	Section 4.2
The proposed structure of the EIS as described in the Notice of Intent is inconsistent with DOE's approach to spent nuclear fuel management at other sites and prematurely promotes a preferred option for managing sodium-bonded spent nuclear fuel. By presuming the proposed action is electrometallurgical treatment, the proposed structure of the EIS effectively establishes this treatment as the preferred alternative for stabilization of this material. While it is reasonable to rule out obviously impractical alternatives in the scoping process, several of the alternatives described in the Notice of Intent are technically viable and should not be prematurely dismissed.	3	Sections 1.2, 1.3, 1.4, and 2.5
DOE should consider the possibility of using different treatment processes for treatment of the driver fuel and the blanket fuel. Could the driver fuel be handled as part of the ongoing demonstration? Treatment alternatives for the blanket fuel could conceivably include direct disposal, as it is not yet clear that it will require treatment before disposal.	1	Sections 2.5.3, 2.5.4, 2.5.5, and 2.5.6
The three alternatives presented for treatment of the EBR-II fuel are the most reasonable ones politically available, namely (1) separate the highly enriched uranium and make the other materials into a ceramic using a hot isostatic press, or (2) separate both the uranium and plutonium using the PUREX process at the Savannah River Site and...vitrify the waste, or (3) direct burial.	1	Sections 2.5, 4.2, 4.3, and 4.4

Table A–3 Other Issues Considered

Issues	*No. of Comments*	*DOE Responses*
Costs		
The public needs information about the cost of the proposed action and the costs of the other technology alternatives before it can adequately comment on the EIS.	6	Information on cost will be made available to the public via the Cost Study, which will be issued during the draft EIS public comment period.
This program is not worth the money it will cost.	1	Information on cost can be found in the Cost Study which, along with the EIS, will factor into the Record of Decision.
The cost assessment has to be part of the EIS.	2	Although the cost assessment is not part of the EIS, it has been prepared concurrently with the EIS. The Cost Study, along with the EIS, will factor into the Record of Decision.

Issues	*No. of Comments*	*DOE Responses*
If you don't account for the low-enriched uranium stream, your cost estimates are going to be wrong or at least off. If you don't have a disposition scenario, you have to look at the long-term economic and environmental storage costs that will belong to DOE for a long time.	2	The environmental impacts and cost of storage of the low-enriched uranium stream have been analyzed in the EIS and Cost Study, respectively.
We think that combining the research and development efforts on these two different types of fuel [blanket and driver] might lead to considerable cost savings.	1	If an alternative technology is chosen that could treat both the driver and blanket fuel, research and development efforts would be combined, as they were for electrometallurgical treatment research and development.
As Savannah River has a huge vitrification facility and that technology already is available, DOE should compare the costs of vitrification with the costs of the PUREX process.	1	The vitrification facility at SRS treats the high-level radioactive waste that results from PUREX processing. The two are not independent. The cost of vitrification will be included in the cost of the PUREX alternative in the Cost Study. Direct vitrification of sodium-bonded spent nuclear fuel, however, is not technically feasible.
Cost analysis should include: (1) program costs so far in detail, including whether these costs were for pyroprocessing or for the EBR-II to shut down; (2) how much it would cost to close out the program at the end of the test, including decommissioning the machinery and dealing with all the waste streams (such as low enriched uranium); (3) what it would cost to scale-up the program, including commissioning and dealing with all waste streams at the end of the scale-up.	1	The Cost Study does not include EBR-II shutdown costs. The Cost Study includes the cost of any new machinery, if needed; treating the sodium-bonded spent nuclear fuel; deactivating machinery; and dealing with the waste streams. The low-enriched uranium product is not a waste. Its disposition will be the subject of a future NEPA review, however, the cost of storage of the low-enriched uranium is included in the Cost Study.
The EIS should include the cost of transportation if this stuff is moved across country from Idaho to South Carolina and then from South Carolina to wherever.	1	The cost of offsite and onsite transportation is included in the Cost Study.
Environment, Safety, and Health		
The Shoshone-Bannock Tribe considers the INEEL land to be part of their original territory and believes the electrometallurgical treatment process will not impact the land's cultural resources or native species and will make the best uses of these resources.	1	The commentor's support for the electrometallurgical technology is acknowledged.
DOE should explain the environmental considerations that are pushing this EIS to completion in such a short period of time, including the environmental threats of continuing to store the EBR-II spent nuclear fuel in Idaho, if any. Then, DOE should compare these environmental threats with the R&D schedule for all the alternative technologies being considered, especially the nonseparation technologies.	1	The purpose and need for agency action is discussed in Section 1.2. Under the No Action Alternative, the Department may decide to continue to store the sodium-bonded spent nuclear fuel indefinitely, or until research and development of an alternative treatment technology is successfully completed.

Issues	*No. of Comments*	*DOE Responses*
DOE should be able to provide the environmental impacts for all of the alternative technologies listed in the Notice of Intent; they should not be dismissed because DOE does not know enough about them.	1	Alternative technologies were not dismissed solely based on the lack of available information on the respective technologies. As discussed on Section 2.6, chloride volatility was dismissed due to the potentially significant (in comparison to other treatment technologies) occupational and public risks from the volatilization of fission products and chloride gas.
Nonproliferation		
Nonproliferation should not be addressed in a separate report; the nonproliferation assessment should be part of the EIS. Short-circuiting the nonproliferation analysis is particularly egregious in light of the pledge in the Notice of Intent to include this assessment in the draft EIS and the existence of such a DOE assessment from December 1998.	3	The Notice of Intent stated, "The combination of the information contained in the draft EIS, the public comment in response to the draft EIS, and the Nonproliferation Impacts Assessment report will enable the Department to make a sound decision..." Although the Nonproliferation Impacts Assessment is separate from the EIS, it will fully analyze the nonproliferation impacts of the alternatives in the EIS.
The public should have an opportunity to comment on the ongoing nonproliferation assessment, and the assessment should be publicly available before the comment period is closed on this EIS.	9	The Nonproliferation Impacts Assessment will be available to the public prior to the end of the public comment period for this draft EIS. However, the assessment will be issued as a final document.
The public needs information about the nonproliferation impacts of the proposed action before it can comment on the EIS.	1	The Nonproliferation Impacts Assessment will be available to the public prior to the end of the comment period for this draft EIS.
The EIS should not be released until nonproliferation concerns no longer are being debated; there is a potential for exporting this technology.	1	The Nonproliferation Impacts Assessment will be available to the public prior to the end of the comment period for this draft EIS.
Given that obtaining fuel material is the greatest hurdle to producing nuclear weapons, DOE should take nonproliferation concerns about small-scale reprocessing technologies like pyroprocessing more seriously and give them greater weight in its decision-making.	2	DOE is concerned with the nonproliferation impacts of all of its proposed actions. It is for this reason that a separate Nonproliferation Impacts Assessment report will be prepared specifically to address the alternatives under consideration.
Pyroprocessing is a proliferation-prone technology. For example, although plutonium no longer would be separated as a separate step in the EBR-II treatment, the original pyroprocessing technology was intended to remove plutonium and actinide components in a liquid cadmium cathode, and that option is always there.	4	DOE has conducted four independent nonproliferation assessments of electrometallurgical technology over the past 11 years. A new assessment that addresses the alternatives under consideration for treating sodium-bonded spent nuclear fuel is being conducted concurrently with the EIS and the report will be available for public review. Previous assessments have concluded that electrometallurgical technology was not capable of separating plutonium in a form that would be suitable for weapons. Development of the liquid cadmium cathode was canceled before significant engineering issues were resolved. No liquid-cadmium cathode was ever completed for the electrorefiners used in the Fuel Conditioning Facility, where spent nuclear fuel treatment would take place.

Issues	*No. of Comments*	*DOE Responses*
Pyroprocessing will continue to search for other missions before the issue of whether it can be shut down and decommissioned on a timely basis is decided. Use of pyroprocessing should be "nipped in the bud" because of nonproliferation concerns.	1	Electrometallurgical treatment technology is a promising technology for the management of spent nuclear fuel. DOE is considering applying this technology for the management of some or all of its sodium-bonded spent nuclear fuel at sometime in the near future. DOE is conducting a Nonproliferation Impacts Assessment that focuses on the application of electrometallurgical and alternative treatment technologies to sodium-bonded spent nuclear fuel. This new assessment will be made available to the public during the draft EIS public comment period. Previous nonproliferation assessments have found electrometallurgical technology to be in accordance with the U.S. nuclear nonproliferation policy for the specific applications considered.
The Savannah River nonproliferation assessment states that pyroprocessing can be modified to produce plutonium. This modification may not be easy, but it would be easier than building an entire PUREX facility or adding such a capability to any of the other nonseparation technology options—and it would certainly be of interest to rogue states who are interested in producing nuclear weapons.	3	The modification referred to in the Savannah River nonproliferation assessment involves adding a proven aqueous process such as PUREX onto the electrometallurgical process. Because the aqueous processes would be incompatible with the dry inert atmosphere required by the electrometallurgical process, a separate facility would be required. If a nation bent on weapons production had this capability, it could separate weapons-usable plutonium directly from spent nuclear fuel or plutonium production targets without the need for the electrometallurgical process equipment.
This program is inconsistent with the present U.S. position on reprocessing. The United States should not be funding new separation technologies.	2	The DOE Office of Arms Control and Nonproliferation will assess the nonproliferation impacts of the alternative treatment technologies under consideration in this EIS in a separate report to determine if the alternatives are consistent with U.S. nonproliferation policy and goals.
Pyroprocessing is reprocessing. MacArthur Prize Fellowship winner Frank Von Hippel and Professor James Warf, inventor of several reprocessing technologies, underscore this fact and express concern about the nuclear nonproliferation impacts of pyroprocessing: "...because pyroprocessing facilities are more compact than conventional facilities, they are easier to conceal. The world would become a more dangerous place."	2	In a nonproliferation assessment conducted for DOE in 1992, a panel of experts stated that there was no reason to conclude that electrometallurgical process facilities would be any easier to conceal than a conventional reprocessing plant. The electrometallurgical process requires a large heavily shielded hot cell with highly purified argon atmosphere and specialized process equipment.
While the Notice of Intent states that DOE has no plans to apply this technology (electrometallurgical treatment) to any other types of spent nuclear fuel, it clearly leaves the door open for other applications and raises the concern that ANL-W will continue to hunt for other materials that can be used to keep the electrometallurgical treatment apparatus operating after the sodium-bonded fuel campaigns are completed, or even to justify construction of new facilities. This open-ended approach...has severe implications for nonproliferation.	1	Electrometallurgical treatment technology is a promising technology for the management of spent nuclear fuel. DOE is considering applying this technology for the management of some or all of its sodium-bonded spent nuclear fuel at sometime in the near future. DOE is conducting a Nonproliferation Impacts Assessment that addresses the application of electrometallurgical technology, as well as the other alternatives under consideration, to sodium-bonded spent nuclear fuel. This new assessment will be made available to the public during the draft EIS comment period. Previous nonproliferation assessments have found electrometallurgical technology to be in accordance with U.S. nuclear nonproliferation policy for the specific applications considered.

Issues	*No. of Comments*	*DOE Responses*
The electrometallurgical treatment process can be modified to produce plutonium. Moreover, there are no plans to place ANL-W facilities under international safeguards. Therefore, from an arms control standpoint, the Fuel Conditioning Facility must be regarded as a dual-use facility capable of being operated as a reprocessing plant. In view of this, it is highly advisable to prepare for timely shutdown of the facility when any campaigns for which it is determined to be essential (if any) are completed.	1	DOE has conducted four independent nonproliferation assessments of electrometallurgical technology. A new assessment that focuses on the application of electrometallurgical technology to sodium-bonded spent nuclear fuel is being conducted concurrently with the EIS and will be available for public review. Previous assessments have concluded that electrometallurgical technology was not capable of separation plutonium in a form that would be suitable for weapons. Development of the liquid cadmium cathode was canceled before significant engineering issues were resolved. No liquid-cadmium cathode was ever completed for the electrorefiners used in the Fuel Conditioning Facility, where the spent nuclear fuel treatment would take place. The Fuel Conditioning Facility operates under DOE safeguards and security requirements.
DOE should make the nonproliferation assessment of the proposed electrometallurgical treatment action a part of the NEPA process. The assessment should cover not only the proposed action, but the broader proliferation implications of continued research and development of this reprocessing technology.	1	DOE is concerned with the nonproliferation impacts of all of its proposed actions. It is for this reason that a separate Nonproliferation Impacts Assessment will be prepared that will specifically address electrometallurgical treatment technology. DOE will consider this assessment in its decision-making process.
One issue that should be covered in the nonproliferation assessment is whether promotion of electrometallurgical treatment as a "proliferation-resistant" technology ultimately will prove harmful to U.S. nonproliferation goals. If this designation does not have a sound technical basis (as we believe it does not), the ultimate result will be an increased danger of proliferation.	1	DOE is concerned with the nonproliferation impacts of all of its proposed actions. It is for this reason that a separate Nonproliferation Impacts Assessment will be prepared that will specifically address electrometallurgical treatment technology.
For nations that reprocess spent nuclear fuel, switching to electrometallurgical treatment may enable them to argue that their current safeguards burden should be relaxed.	1	Prior to the export of any technology that may have nonproliferation impacts to a foreign nation, DOE assesses the impacts, if any, to ensure that U.S. nonproliferation goals are met.
The EIS should include a detailed, thorough analysis of the weapons proliferation implications of each treatment alternative.	1	DOE's Office of Arms Control and Nonproliferation is preparing a Nonproliferation Impacts Assessment of each treatment alternative. This new assessment will be made available to the public during the draft EIS public comment period.
One of the justifications for proceeding with the mixed oxide (MOX) proposal was to satisfy the international community's desire to forestall the ready availability of weapons-grade materials. This proposal creates the ready availability of those same materials. The EIS must account for this apparent contradiction of policy and address the measures intended to safeguard the by-product(s) of this process.	1	DOE recognizes the need to identify nonproliferation impacts of the treatment technologies. Therefore, the DOE Office of Arms Control and Nonproliferation will assess the nonproliferation impacts of the alternative treatment technologies in a report, separate from this EIS.
Alternative Technologies		
The EIS should re-evaluate and address plutonium separation; it would be less expensive to separate the plutonium because that would mean the repository would need to last only 300 years, instead of 10,000.	1	The EIS is evaluating plutonium separation as a part of the PUREX option for the blanket fuel. Plutonium separation would not guarantee a different performance requirement for the repository, since the long-term requirements are driven by other radioisotopes.

Issues	*No. of Comments*	*DOE Responses*
DOE has already made up its mind. Other methods than pyroprocessing haven't been given sufficient attention. These alternative methods continually are slated as "not developed enough." Yet in three years, there hasn't been much attention given to developing them to a point where they could be reviewed fairly. Alternative new technologies should not be dismissed due to lack of knowledge about them.	4	In response to public comments, DOE has reformulated the scope of the EIS to address more generally the treatment and management of DOE sodium-bonded spent nuclear fuel. Information developed in the course of preparing this EIS suggests that alternative technologies may have certain advantages (e.g., cost) for some or all of the fuel. Accordingly, DOE did not identify a preferred alternative in the Draft EIS. In the EIS, DOE also considers an option under the No Action Alternative in which the Department would actively conduct research and development of promising new technologies.
The Notice of Intent is biased toward electrometallurgical treatment because it disparages the other alternatives, which are tacked on just to satisfy a legal requirement. The program is taking the wrong approach toward electrometallurgical treatment because the alternatives are not really valid.	2	In response to public comments, DOE has reformulated the scope of the EIS to address more generally the treatment and management of DOE sodium-bonded spent nuclear fuel. Information developed in the course of preparing this EIS suggests that alternative technologies may have certain advantages (e.g., cost) for some or all of the fuel. Accordingly, DOE did not identify a preferred alternative in the Draft EIS. In the EIS, DOE also considers an option under the No Action Alternative in which the Department would actively conduct research and development of promising new technologies.
There is a danger that other technologies will be abandoned if, as it appears, DOE is rushing to produce waste or materials to go to a waste site somewhere or is pushing pyroprocessing ahead of other technologies.	1	In response to public comment, DOE has restructured the alternatives to be considered, including an option of deferring a treatment decision and developing alternative technologies.
The EIS should identify the alternative sites if Idaho is not selected and which sites will be needed for the alternative technologies.	1	The EIS has identified the SRS as an alternative site for the PUREX and melt and dilute alternatives.
The EIS should include a stabilization timeline on environmental grounds for EBR-II spent nuclear fuel. The time line should include the time needed to more fully develop other alternatives.	2	EBR-II spent nuclear fuel must be removed from the State of Idaho by the year 2035 in accordance with a DOE/State of Idaho Settlement Agreement and Consent Order, signed in October of 1995. DOE believes that treatment to remove sodium from EBR-II and other spent nuclear fuel will make acceptance of this fuel in a national geologic repository much more likely.
Will the EIS look at the vitrification facility at INTEC?	1	The proposed Vitrification Facility at INTEC is not compatible with any of the proposed waste forms or metal fuel such as the EBR-II or Fermi-1 fuel. It is for this reason that DOE has not analyzed this facility in the EIS.
The EIS should address the size of the electrometallurgical treatment facility and whether the plant capacity is greater than needed for the proposed mission (more than 62 metric tons of heavy metal).	1	The plant capacity for treating spent nuclear fuel using the electrometallurgical treatment equipment is approximately 5 metric tons of heavy metal per year. It would therefore require 12 years to treat the entire 60-metric ton DOE sodium-bonded spent nuclear fuel inventory.
The Notice of Intent indicates that DOE has no plans to apply electrometallurgical treatment to any other spent nuclear fuel types, suggesting the plant would be decommissioned after completing the electrometallurgical treatment mission for sodium-bonded spent nuclear fuel. The EIS, therefore, should address the impacts of decommissioning the plant.	2	At this time, DOE has no intent to apply electrometallurgical treatment to any other spent nuclear fuel types. The electrometallurgical treatment process equipment is housed within a large multipurpose hot cell facility which has programmatic value to DOE, even in the absence of a spent nuclear fuel treatment program. Any specific electrometallurgical treatment equipment would be deactivated at the end of any treatment program; however, there are no plans to discontinue use of the hot cell facility.

Issues	*No. of Comments*	*DOE Responses*
Use a reactor or accelerator to fission the transuranic material.	1	This is not a reasonable alternative because the transuranic materials resulting from the electrometallurgical treatment process would require extensive additional processing before they would be suitable for fission in a reactor.
Adding another furnace and cathode to ANL-W's facility would both accelerate the processing and provide opportunities for new research.	1	The existing electrometallurgical treatment equipment would provide DOE an adequate processing rate for the sodium-bonded spent nuclear fuel inventory. New research would be accomplished with equipment in a nonradioactive laboratory environment.
Regarding the use of melt and dilute and Savannah River—the Savannah River process will not be sized or configured to handle INEEL fuel (which should be contrary to the Foreign Research Reactor Record of Decision). Melt and dilute at INEEL solely should be the alternative.	1	The sodium-bonded fuel would have its cladding and sodium removed before being placed in aluminum cans for shipment to the SRS, where the proposed melt and dilute process would take place. This pretreatment step would make the fuel compatible with the proposed SRS process.
Sodium is highly reactive with water/moisture, and this property could be taken advantage of by controlled reaction on a limited scale—exposing the sodium-bonded material to moisture. The sodium hydroxide formed could be neutralized with an appropriate acid, allowing the remaining spent nuclear fuel to loose its pyrophoric properties. Please address this in the EIS.	1	For fuel in which the sodium can be exposed, the EIS describes a process for safely removing it by vacuum distillation. The process described in the comment would accelerate corrosion of the uranium, resulting in an unsafe pyrophoric condition.
DOE may want to consider an alternative that examines the relationship between the EBR-II fuel at INEEL and the high-level radioactive waste at the stabilization facility.	1	The proposed INEEL high-level radioactive waste management EIS is considering methods to manage the calcine that was produced from the reprocessing of DOE spent nuclear fuel at INTEC. With the decision to shut down the reprocessing facilities, no processes are currently available that would make the sodium-bonded fuel compatible with the calcine.
The fall 1996 National Research Council report on pyroprocessing at ANL states that even more time and money than originally planned will be needed to "achieve the program's objectives" and raises troubling questions about several aspects of the research itself. Later reports, unfortunately, do not specifically follow up on these concerns.	1	DOE's Electrometallurgical Research and Demonstration Project has addressed concerns that have been raised by the National Research Council. Their 1998 report has recognized the progress in the Demonstration and has stated it should continue to completion.
The fall 1996 National Research Council report raises serious concerns about several aspects of the research including a lack of coordination between ANL East and West. This lack of coordination and differing goals have led to duplicate efforts in at least one case and equipment failures. The report notes the lack of a "well-coordinated implementation plan between ANL East and West...."	1	DOE's Electrometallurgical Research and Demonstration Project has addressed concerns that have been raised by the National Research Council. Their 1998 report has recognized the progress in the Demonstration and has stated it should continue to completion. DOE's Electrometallurgical Research and Demonstration Project, which is nearing completion at ANL-W, has successfully met National Research Council criteria to date. The success of this demonstration project has been possible only through close coordination between scientists and engineers at ANL-East and -West.

Issues	*No. of Comments*	*DOE Responses*
The [fall 1996 National Research Council] report found that equipment is not performing at expected levels and separation efficiencies are lower than expected. This means that, so far, the basic goal of the pyroprocessing program—to separate the uranium from the rest of the irradiated fuel—has not been met.	1	DOE's Electrometallurgical Research and Demonstration Project has addressed concerns that have been raised by the National Research Council. Their 1998 report has recognized the progress in the Demonstration and has stated it should continue to completion.
Research on selected alternatives should have been carried out to support a defensible analysis of their feasibility in the EIS.	1	The alternatives to be analyzed in detail are described in Chapter 2 of the EIS. An analysis of their feasibility is included in this chapter.
DOE has not demonstrated there is a safety-based need to process the driver fuel by experimentally assessing the impact of elemental sodium on radionuclide leach rates.	1	DOE has proposed treatment to remove the sodium from sodium-bonded spent nuclear fuel to allow acceptance of this fuel in a national geologic repository. This is because sodium reacts with water in the environment to form corrosive sodium hydroxide solutions and potentially explosive hydrogen gas.
DOE should initiate a process similar to the Processing Needs Assessment to determine at the earliest possible date the "small quantities of certain spent nuclear fuel types" that may be considered for electrometallurgical treatment in the future. Such an effort is essential for shutdown and decommissioning planning.	1	At this time DOE has no intent to apply electrometallurgical treatment to any other spent nuclear fuel types. If, during the sodium-bonded fuel treatment program, DOE finds another application for electrometallurgical treatment at ANL-W, the development of plans to deactivate the electrometallurgical treatment equipment at ANL-W would be delayed accordingly.
A study similar to the 1997-98 Processing Needs Assessment should be conducted to identify all materials in the DOE complex that might need reprocessing in the Savannah River Site canyons for stabilization purposes, thus limiting the universe of potential uses for the canyons and facilitating planning for their shutdown. A similar process should be conducted for the Fuel Conditioning Facility as part of this EIS process, with the opportunity for full public participation and comment.	1	The EIS is being coordinated with other DOE EIS documents and Records of Decision concerning complex-wide management of spent nuclear fuel. These EISs are described in Section 1.6 of this EIS.
It is unfortunate that the option of separating the plutonium along with the uranium by the electrometallurgical process could not have been considered. Although the resulting fissile material would only have been suitable for a fast-neutron reactor...at least we would not have the agony of worrying about putting this plutonium in a repository.	1	The electrometallurgical process cannot separate plutonium. Because of potential nonproliferation implications, the Department elected not to develop the capability for electrometallurgical processing to produce any plutonium-bearing product. Plutonium separation is an integral part of Alternative 3, PUREX Processing of the Blanket Fuel at SRS. However, removal of the plutonium would not significantly affect the long-term performance of the repository, which is driven by other radioisotopes.
Since the electrometallurgical method works, is ready to go, and is not expensive, it is in the public interest to get the fuel treatment job done rather than delay while developing some other method.	1	The commentor's support of the electrometallurgical treatment technology is acknowledged.

Issues	*No. of Comments*	*DOE Responses*
The addition of depleted uranium to the electrometallurgical treatment process is both a waste of depleted uranium and enriched uranium. Why add the depleted uranium?	1	Blending depleted uranium with the highly enriched uranium recovered from the spent EBR-II driver fuel results in low-enriched uranium. This step, which is consistent with U.S. nonproliferation policy, results in lower costs for storing and safeguarding the uranium. Because the uranium ingots still contain more enrichment than is required for commercial power reactor fuel, their potential economic value is not decreased. The Department currently stores more than 500,000 tons of depleted uranium for which no immediate use is planned. Using some 10 tons of this inventory for treating spent nuclear fuel would have no discernable impact.
Waste		
The EIS should address the disposal specifications for spent nuclear fuel, and DOE should make sure that, whatever technology is selected, the spent nuclear fuel will meet repository specifications. This determination should be made before the canyons are shut down to avoid precluding a way to get rid of the materials.	1	The ceramic and metallic high-level radioactive waste forms that would be produced from the proposed action are expected to be at least as durable as the borosilicate glass high-level radioactive waste form. The design criteria for the national spent nuclear fuel repository include receipt and disposal of the borosilicate glass high-level radioactive waste.
The EIS should explain why stainless steel and noble metals are considered waste and not potentially valuable resources.	1	The stainless steel and noble metals would be part of the metallic high-level radioactive waste forms. High-level radioactive waste is a material that the U.S. Nuclear Regulatory Commission has determined requires permanent isolation.
Waste characterization is a problem. Low enriched uranium is a problem-it's a waste not a product. The EIS should look at the long-term storage costs of uranium.	2	DOE does not consider low-enriched uranium to be a waste. No highly enriched uranium would result from any of the alternatives considered at INEEL.
Discussion of the low-enriched uranium stream must include a full analysis of what happens to this stream and when.	1	DOE has not made a decision concerning future uses for the low-enriched uranium other than that the low-enriched uranium would not be used for defense purposes.
Spent nuclear fuel is not a waste.	1	Spent nuclear fuel is a fuel that has been withdrawn from a nuclear reactor following irradiation; the constituent elements have not been separated for reprocessing.
The project is being sold as a way to reduce the volume of waste to Yucca Mountain. It won't reduce actual volume; it will only increase floor space by putting ceramic and metallic waste forms closer together while still avoiding criticality issues. That's where your 65 percent comes from. You don't have volume reduction; you just have split the waste into lots of different forms which you still have to find a home for. But the message that is getting out is that you will be sending a smaller by weight number of packages to Nevada.	3	Waste volumes, masses, and disposal paths for all types of waste are considered for the different alternatives in this EIS. The volume of high-level radioactive waste or spent nuclear fuel that would be sent to a geologic repository are some of the things considered in the waste management sections. The potential impact on different disposal sites is considered and discussed. However, the purpose and need for the proposed action is to treat and manage the spent fuel, not to reduce the volume of waste that eventually will be sent to a repository.
DOE does not know if electrometallurgical treatment waste will meet the repository waste acceptance criteria. DOE does not know what those criteria will be—or if there will be any repository at all. Will the waste be acceptable? We need honest assumptions on the waste stream.	4	The repository waste acceptance criteria are still being developed. However, the ceramic and metallic waste forms that would result from the electrometallurgical treatment process are expected to be accepted into the repository.

Issues	*No. of Comments*	*DOE Responses*
DOE should consider dealing with this high-level radioactive waste as part of the high-level radioactive waste being dealt with at INTEC.	1	The proposed INEEL High-Level Radioactive Waste Management EIS is considering methods to manage the calcine that was produced from the reprocessing DOE spent nuclear fuel at INTEC. With the decision to shut down the reprocessing facilities, no processes are currently available that would make the sodium-bonded fuel compatible with calcine. The restart of these facilities was considered and eliminated from the alternatives.
DOE admits to having no knowledge of the whereabouts of the documents pertaining to previous removal of the sodium bonding from 17 metric tons of EBR-II blanket fuel via mechanical decladding. Such mismanagement, if true, is of concern and should be investigated. We request that a greater effort be undertaken to find these documents and make them publicly available during the EIS period.	1	DOE has found the documents that describe the process, equipment, operating procedures, and waste disposal paths for the decladding and sodium removal of the 17 metric tons of EBR-II blankets. These documents were considered during the selection of the proposed decladding and sodium removal alternatives.
DOE's plans for disposing of the low-enriched uranium created from this process—will it be stored as a waste or sold as a resource?	2	DOE has not made a decision concerning future uses for the low-enriched uranium produced by the electrometallurgical treatment other than the decision that the low-enriched uranium would not be used for defense purposes.
This program [electrometallurgical treatment] has no place in a sound nuclear waste management policy. Proponents of this program are . . . making the problem worse not better. This program will increase the complexity and amount of nuclear waste generated at ANL. We do not support an expansion of this program and urge that it be terminated.	1	DOE believes that treating sodium-bonded spent nuclear fuel is in keeping with sound nuclear waste management. This is because the proposed action would reduce uncertainty regarding waste disposal. Also, the number of canisters that must be disposed of in a geologic repository would be reduced. Further, ceramic and metallic waste material is very durable and has been formulated to be unreactive in the environment.
If DOE creates high-level radioactive waste in a vitrified form, there will be three forms of high-level radioactive waste in one Idaho county (ceramic, metal, vitrified).	2	The statement is correct. Different waste streams often require different stabilization techniques. The ceramic, metallic and vitrified waste forms are being developed because they are best suited for specific waste streams.
If this material won't meet the disposal specifications for the repository, a specification should be incorporated into the Record of Decision to say that DOE will look at this material and its proposed specifications before the canyons are shut down to ensure it is as good as the PUREX borosilicated glass that is being prepared for the Yucca Mountain repository.	1	DOE will consider the programmatic impacts including schedule and technical uncertainties such as availability and waste acceptance when a Record of Decision is made.
Since the waste acceptance criteria at Yucca Mountain currently is not confirmed, how do you intend to meet and store [the waste] for "road-ready" conditions?	1	The present goal is to place the spent nuclear fuel and high-level radioactive waste at ANL-W in retrievable storage so that it can be shipped to the proposed packaging facility that will ship the INEEL-DOE spent nuclear fuel to the repository. For the SRS alternatives, the high-level radioactive waste glass or melt and dilute product would be coordinated with the streams that will be produced at SRS.

Issues	*No. of Comments*	*DOE Responses*
Will planned dry storage have to be retreated later to meet acceptance criteria at Yucca Mountain?	1	The No Action Alternative may require future treatment. The goal of the other alternatives is to put the waste in road-ready condition without further treatment. The uncertainty in the final repository waste acceptance criteria is part of the programmatic considerations.
Uranium metal also is reactive; will it be treated before placement in a geologic depository?	1	Uranium metal is currently managed as part of the Materials Disposition program and is out of the scope of the EIS.
The Environmental Assessment contained ridiculous estimates of waste streams, especially the low-level radioactive waste streams. Actual information about waste generated from the demonstration project should be released to the public for use in the EIS.	1	The actual waste generation rates for the demonstration project have been used to calculate estimates of waste streams in this EIS.
Previous National Research Council reports have concluded that several of the waste forms generated by this technology [pyroprocessing] would not be suitable for placement in a geologic repository. The fall 1996 National Research Council report raises serious concerns about the testing procedures used to determine whether one of the new waste forms will be suitable for placement in a geologic repository. Most troubling of all is the analysis of ANL's choice of test protocol. A key issue is the release of the radionuclides from the waste. The report notes that the test protocol focuses on a radionuclide release mechanism that is... "incorrect at best, and potentially misleading at worst."	1	In order to address the question on waste form qualification, DOE has asked the National Research Council to conduct a specific review on this subject. The report that discusses the results of this waste qualification review and the other National Research Council reports will be considered when a record of decision is formulated.
Since getting waste ready for a geologic repository is the justification for this project, it must not go forward until the waste produced by the demonstration project has been fully characterized, which will occur early in the next century.	1	The uncertainty and status of each waste or spent nuclear fuel characterization are part of the programmatic consideration when a record of decision is formulated.
Spent nuclear fuel must be removed by 2035 as a result of processing. One concern is that transuranic waste will go to the repository, but low-enriched uranium and highly enriched uranium will stay at INEEL.	1	No highly enriched uranium would result from any of the alternatives considered at INEEL. DOE has not made a decision concerning future uses for the low-enriched uranium other than the decision that the low-enriched uranium would not be used for defense purposes. DOE will compare all reasonable alternatives on the basis of cost, including the cost of long-term storage of materials.
Compare heat loading with the ceramic and metallic waste forms to heat loading of the highly enriched uranium rods—are they comparable with commercial spent nuclear fuel?	1	As packaged for disposal in a geological repository, the heat loading for the ceramic and metallic waste forms is higher than that for the highly enriched uranium fuel because of fissile material limits for disposal packages. These high-level radioactive waste packages in general have lower heat loads than commercial spent nuclear fuel. Heat load would not be a concern regarding potential disposal in a geologic repository.
Transportation		
These materials should not be transported throughout the United States.	1	It is DOE's intention to minimize transport of radioactive materials associated with its sodium-bonded spent nuclear fuel inventory wherever possible.

Issues	*No. of Comments*	*DOE Responses*
If the ultimate burial place for the high-level radioactive waste is 1,000 miles away instead of 2,000 miles away, is that fact insignificant to transportation?	1	Generally, the environmental impacts of transporting spent nuclear fuel and high-level radioactive waste are small and would not differ significantly under the example posed by the commentor. DOE recommends the commentor see the *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* for additional information on this subject.
The EIS should evaluate the potential for terrorism, especially during transportation.	2	The potential for terrorist acts involving material transports does not fall within the scope of this EIS.
Is it not known that, if the waste is sent to South Carolina [SRS], it will have to go somewhere else eventually; it won't stay in South Carolina?	1	As described in Section 2.5 of the EIS, Alternatives 3 and 5 would result in the storage of waste or by-products at SRS in South Carolina. For Alternative 3, the products from processing blanket fuel in the PUREX facility would be plutonium metal, borosilicate glass logs, and depleted uranium. For Alternative 5, the metallic waste product from the blanket fuel melt and dilute process would be stored in the L Area at the SRS.
The EIS should provide bounding estimates of the size, frequency, and number of expected shipments of products coming into Idaho.	1	Chapter 4 and Appendix G of the EIS provide estimates of the size, frequency, and number of expected shipments of products coming into Idaho. The Record of Decision for the 1995 *Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement* also describes the size, frequency, and number of spent nuclear fuel shipments coming to Idaho.
DOE should develop an agreement with the Shoshone-Bannock Tribes to allow and appropriately manage the transport of any radioactive materials across the reservation.	1	Regardless of the alternative chosen, DOE will proceed in accordance with the DOE/Shoshone-Bannock Tribes Agreement-in-Principle, which covers notification and coordination of the transport of radioactive materials across the Fort Hall Reservation.
EIS Schedule		
This EIS may not be needed because the 1996 Environmental Assessment may be adequate.	1	DOE prepared an environmental assessment for the demonstration of electrometallurgical treatment on a limited amount(1.6 metric tons) of sodium-bonded spent nuclear fuel. In the May 15, 1996 Finding of No Significant Impact for the Environmental Assessment, DOE committed to prepare an EIS before applying the electrometallurgical treatment technology to the production-scale treatment of the sodium-bonded spent nuclear fuel inventory.
The Draft SBSNF EIS should not be issued for public comment before publication of relevant reports (e.g., waste qualification) from the National Research Council or the ongoing nonproliferation study. The schedule implies that DOE is not interested in incorporating the results from these studies into the EIS. Therefore, the time line for the EIS should delay its completion until at least three months after completion of these studies.	5	The Electrometallurgical Research and Demonstration Project is scheduled to conclude in August of 1999. At that time DOE will know if it has met the success criteria established by the National Research Council for the electrometallurgical treatment demonstration. Publication of the final report on the electrometallurgical treatment demonstration by the National Research Council may require a few months past the end of the demonstration project. DOE expects that the report will be available before it makes a decision on the management of the sodium-bonded spent nuclear fuel. DOE has prepared a Nonproliferation Impacts Assessment that addresses the treatment of sodium-bonded spent nuclear fuel.

Issues	*No. of Comments*	*DOE Responses*
This EIS is premature. The Draft SBSNF EIS should not be issued for public comment before publication of the National Academy of Science's Independent Assessment Final Report on the demonstration project, which probably won't be issued until October or November 1999. The National Academy of Sciences Final Report is answering the question, "Will it work," not, "Will it help?"	6	DOE believes that the results from the demonstration and the need to effectively utilize available resources justify the preparation of the EIS in parallel with the final demonstration reviews. The National Research Council has conducted ongoing reviews and issued status reports on the demonstration project. These reports are available for review and the final report will be considered when a record of decision is formulated.
DOE is premature in preparing this EIS because the demonstration project will not be completed until after the draft EIS is published.	11	The Electrometallurgical Treatment Research and Demonstration Project that began in June 1996 is scheduled to conclude in August 1999. At that time DOE will know if it has met the success criteria established by the National Research Council for the electrometallurgical treatment demonstration. DOE has obtained encouraging data from the demonstration to date, and is confident that the technology holds promise for the management of its sodium-bonded spent nuclear fuel inventory. Publication of the final report on the electrometallurgical treatment demonstration by the National Research Council may require a few months past the end of the demonstration project. DOE plans to make its decision in January 2000, based on the U.S. Nuclear Regulatory Commission final report and other factors such as cost, environmental consequences, and nonproliferation impacts.
DOE's willingness to proceed at this pace without even the completion of their demonstration project indicates the decision on pyroprocessing was made years ago.	2	DOE has made no decision on how the sodium-bonded spent nuclear fuel should be treated. The EIS addresses reasonable alternatives for treatment of this fuel.
More research and development should be completed before the Record of Decision on the alternatives.	1	DOE believes that enough is known about the alternatives to assess their environmental consequences in the EIS. DOE plans to make its decision on how to manage its sodium-bonded spent nuclear fuel in January 2000, based on such factors as technical feasibility, cost, environmental consequences, and nonproliferation impacts.
The EIS is premature in that there has not been enough time allowed to include the cost analysis.	1	A report comparing the costs of the alternatives will be made available to the public during the public comment period for the draft EIS.
We question the issuance of the Notice of Intent at this time and believe that it should be withdrawn pending compilation of all the technical documentation necessary to inform the scoping process.	1	DOE believes that adequate presentations, displays, and written materials on the proposed action and alternatives were provided to the public during the scoping process.
Although there is a regulatory driver for removal of this fuel from Idaho, that is not until 2035, and budget maintenance does not justify going ahead with this process until concerns about its technical feasibility, cost-effectiveness, and potential for proliferation have been adequately addressed. I recommend that DOE provide compelling evidence that it is prudent to proceed with preparing an EIS at this time.	2	DOE believes that enough is known about the alternatives to assess their environmental consequences in the EIS. DOE plans to make its decision on how to manage its sodium-bonded spent nuclear fuel in January 2000 based on factors such as technical feasibility, cost, environmental consequences, and nonproliferation impacts.

Issues	*No. of Comments*	*DOE Responses*
Miscellaneous		
This activity could be viewed as corporate welfare which, whether true or not, always is a concern.	2	DOE has identified the purpose and need for the proposed action, which is found in Section 1.2 of the draft EIS. Action is necessary for the responsible management of DOE's inventory of sodium-bonded spent nuclear fuel.
The intent of the agreement between the Governor of Idaho and DOE involves removing large amounts of radioactive materials, not just spent nuclear fuel.	1	The approximate 60 tons of sodium-bonded spent nuclear fuel currently stored in Idaho contains radioactive materials that cannot be reused, recycled, or disposed of in their current condition. Part of the intent of DOE's proposal is to prepare these materials for disposal or possible reuse for commercial purposes.
If a source is referenced in the EIS, it should be summarized in the EIS (e.g., EAR in the Depleted Uranium Hexafluoride Programmatic EIS).	1	Some reference documents are very large and difficult to summarize. Where practical, DOE has provided a brief summary of reference documents in the EIS.
DOE is not going to consider public comments; instead it is engaging in a show process that meets the bare minimum legal requirements.	1	DOE is considering and will continue to consider public comments in its sodium-bonded spent nuclear fuel management decision process. For example, DOE will provide a comparative Cost Study and a Nonproliferation Impacts Assessment to the public in response to comments received during the scoping process. Further, DOE has reformulated its proposed action in response to public comments.
It seems a bit of a waste of the public's time to continue to have these EISs in which we comment saying, "Slow down, we want more information," and DOE says, "Sure," and proceeds right along with its decision in the first place.	1	DOE is committed to providing the public the opportunity to review and comment on the proposed action to manage its inventory of sodium-bonded spent nuclear fuel.
This is not an EIS asking, "We've got a bunch of sodium-contaminated fuel. What should we do with it? We have the following five alternatives." We don't have an action that says, "We need to treat this fuel. We have EISs on it. We want to do pyroprocessing." It is lip service to the other alternatives that are available to deal with this spent nuclear fuel.	1	In response to public comments, DOE has revised the proposed action of the EIS from electrometallurgical treatment of sodium-bonded spent nuclear fuel in the Fuel Conditioning Facility at ANL-W to the treatment and management of sodium-bonded spent nuclear fuel.
We are gravely concerned with the project. We oppose it. We have opposed it all along.	1	DOE acknowledges the commentor's opposition to the proposed action.
That DOE is not waiting for the National Academy of Sciences' Final Report raises a question that Pit Nine also raises. DOE gets a lot of research and development money every year; do the data you collect mean anything?	1	The Electrometallurgical Treatment Research and Demonstration Project that began in June 1996 is scheduled to conclude in August 1999. At that time DOE will know if it has met the success criteria established by the National Research Council for the electrometallurgical treatment demonstration. DOE has obtained encouraging data from the demonstration to date, and is confident that the technology holds promise for the management of its sodium-bonded spent nuclear fuel inventory. Publication of the final report on the electrometallurgical treatment demonstration by the National Research Council may require a few months past the end of the demonstration project. DOE plans to make its decision in January 2000 based on the National Research Council's final report and other factors such as cost, environmental consequences, and nonproliferation impacts.

Issues	*No. of Comments*	*DOE Responses*
What is the endpoint for the National Research Council's waste characterization study? Is it a moving target or a dead horse?	1	The National Research Council is reviewing the waste qualification process and the acceptability of the waste forms.
I would like to see the products identified [cost analysis, nonproliferation analysis] in the briefing placed on a schedule that fits into the Secretary of Energy's decision on the Record of Decision. This schedule ought to be made available to the stakeholders.	1	DOE is preparing a Nonproliferation Impacts Assessment that addresses the treatment of sodium-bonded spent nuclear fuel. This assessment will be made available to the public during the draft EIS public comment period. DOE is also preparing a comparative Cost Study which will be made available to the public during the draft EIS public comment period.
In the past, DOE has had to redo work because of an inadequate initial assessment of a problem. The commentor hopes DOE will avoid such costly problems by proceeding only if it is clear that treatment is necessary. The commentor will be pleased to see DOE proceed with treating the spent nuclear fuel once adequate environmental documentation has been completed and once it has been established that treatment will be necessary before disposal.	1	This NEPA process will aid DOE in making an informed decision on how to proceed with the management of its sodium-bonded spent nuclear fuel. The alternatives analyzed in this EIS include no action and direct disposal with no treatment. DOE will make its decision in January 2000 based on the analytical results of this EIS combined with public comments on the draft EIS and the outcome of the demonstration project, as well as cost, schedule, and nonproliferation considerations.
Would it not be more realistic to base risk analysis on a Hormissis theory rather than the Linear Threshold theory?	1	The EIS acknowledges that there are other views on the effects of radiation at low dose rates. However, the linear dose response is the most accepted as well as the most conservative of current models, and is therefore appropriate for this analysis.
Press for the quickest, most scientifically proven solution to the preparation of this spent nuclear fuel for a repository.	1	DOE will make its decision in January 2000 based on the analytical results of this EIS combined with public comments on the draft EIS and the outcome of the demonstration project, as well as cost, schedule, and nonproliferation considerations.
Has integration/consolidation with other treatment/conditioning being performed at other DOE sites (Hanford, Savannah River) been considered?	1	DOE has considered the use of other DOE facilities as options for the management of sodium-bonded spent nuclear fuel. These issues were a major consideration of the DOE Programmatic Spent Nuclear Fuel EIS (April 1995). Alternatives 3 and 5 of the SBSNF EIS involve the use of two different facilities at SRS in South Carolina.
What happens in the No Action [Alternative] after 2035?	1	Under the No Action Alternative, the EIS evaluates the viability of direct disposal of sodium-bonded spent nuclear fuel in a geologic repository with no treatment, as well as storing the spent nuclear fuel and pursuing the research and development of a new or immature technology
Can the sodium be leached from the uranium?	1	The bond sodium could be melted and drained from the blanket fuel. The melt and drain process would not be effective on the sodium-bonded driver fuel because some of the bond sodium is inside or is encapsulated within the uranium material, and the uranium has become mechanically attached to the stainless-steel cladding.
Put the uranium into commercial fuel.	1	Although DOE has not made a decision regarding the disposition of low-enriched uranium, there is a possibility that the low-enriched uranium could be sold to the commercial reactor fuel industry as a feedstock material.

Issues	*No. of Comments*	*DOE Responses*
Few details about the [electrometallurgical treatment] process were provided [in the presentation].	1	The intent of the public scoping meeting presentation was to give the public a general overview of the NEPA process, electrometallurgical treatment, and other alternatives. The public meeting presentations during the draft EIS comment period will contain more detail about the electrometallurgical treatment process.
We believe that important questions about cost and waste characterization have been left out of most reviews of this program and urge the Energy Information Agency take an honest, comprehensive look at these issues.	1	As requested by members of the public during the scoping process, DOE is preparing a comparative Cost Report which will be made available to the public during the draft EIS comment period. DOE will make its decision in January 2000 based on the outcome of the demonstration project and other factors such as cost, environmental consequences, and nonproliferation impacts.
This program was featured on *NBC Nightly News* as a "Fleecing of America." According to DOE, this program is being created to cover the "redirection of valuable intellectual and physical resources at ANL.....as a result of the shutdown of the nuclear breeder reactor program known as the Advanced Liquid Metal Reactor). We are outraged that a key piece of a program that was supposedly terminated by Congress—the Advanced Liquid Metal Reactor—continues to squander taxpayer dollars on questionable "termination costs" and a wrong-minded "redirection" program known as pyroprocessing or electrometallurgical treatment at ANL. ...We are extremely concerned that this new "Nuclear Technology Research and Development" program represents nothing more than a continuation of the fuel reprocessing activities supported by the Advanced Liquid Metal Reactor program	1	The electrometallurgical treatment technology under consideration in the EIS for treating sodium-bonded spent nuclear fuel is a technology that was originally developed as part of DOE's Advanced Liquid Metal Reactor Program, which was discontinued in 1994. This technology was developed at significant expense to the taxpayer. DOE would be remiss in its responsibilities not to evaluate the potential application of this technology to the Department's sodium-bonded spent nuclear fuel. DOE believes that its proposal to apply electrometallurgical technology to the management of its sodium-bonded spent nuclear fuel inventory has the potential to solve a significant problem for the Nation.
DOE's record with other reprocessing technologies has been abysmal.	1	DOE has successfully used reprocessing technologies in the past to provide nuclear materials for research and defense purposes. The use of PUREX processing for the declad and cleaned blanket fuel [Alternative 3] is a viable option..
The [Snake River] Alliance encourages DOE to include ANL-W as part of INEEL in environmental analyses.	1	DOE has included the ANL-W facility as part of the INEEL in analyzing the environmental consequences of the alternatives in this EIS, as well as in the *DOE Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement*.
The commentor would prefer to see the spent nuclear fuel treated only once if possible.	1	DOE also would prefer to treat its sodium-bonded spent nuclear fuel only once, if at all, before its final disposition.
To support informed public review of the draft EIS, the schedule for this EIS should allow for adequate public review of related documents before the close of the public comment period.	1	The schedule for this EIS allows 45 days for public comment, in accordance with NEPA requirements. Related reports such as those on costs and nonproliferation issues will be available to the public within the same time frame as this draft EIS.

A.2 THE PUBLIC COMMENT PROCESS

A.2.1 Overview

In July 1999, DOE published the *Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel*. NEPA regulations mandate a minimum 45-day public comment period after publication of a draft EIS to provide an opportunity for the public and other stakeholders to comment on the EIS analysis and results. The 45-day public comment period on the Sodium-Bonded Spent Nuclear Fuel (SBSNF) Draft EIS began on July 31, 1999, and was scheduled to end on September 13, 1999. In response to commentor requests, the comment period was extended an additional 15 days through September 28, 1999. During this 60-day comment period, public hearings were held in North Augusta, South Carolina; Boise and Idaho Falls, Idaho; and Arlington, Virginia (see **Figure A–2)**. In addition, the public was encouraged to submit comments via the U.S. mail service, e-mail, a toll-free 800-number phone line, and a toll-free fax line. Section A.2.4 summarizes the major issues raised by comments received through the public comment process and DOE's position with respect to these comments.

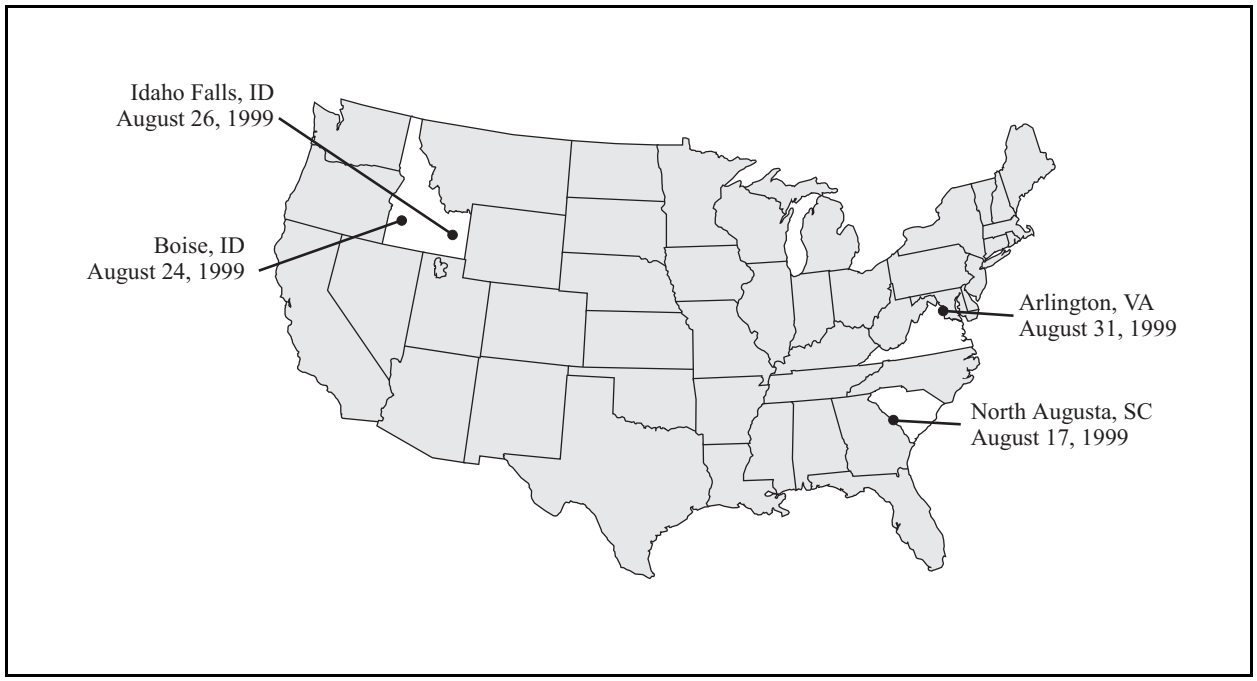

Figure A–2 Public Hearing Locations and Dates, 1999

The number of persons estimated in attendance at each hearing or meeting, together with the number of comments submitted and recorded, are presented in **Table A–4**. These attendance estimates are based on the number of registration forms completed and returned at each hearing or meeting, as well as a rough "head count" of the audience, and may not include all those present.

The public hearing comments were combined with comments received by other means (mail, e-mail, 800-number, fax) during the comment period. Written comments were date-stamped and assigned a sequential document number. **Table A–5** lists the number of comments received by method of submission.

Table A–4 Public Hearing/Meeting Locations, Attendance, and Comments Received

Location	*Date*	*Estimated Attendance*	*Comments*
North Augusta, South Carolina	August 17, 1999	20	18
Boise, Idaho	August 24, 1999	3	19
Idaho Falls, Idaho	August 26, 1999	45	21
Arlington, Virginia	August 31, 1999	20	25

Table A–5 Method of Comment Submission

Method	*Number of Comments*	*Number of Submittals*
Faxes	49	6
U.S. mail/hearing submittals	264	27
1-800 number	16	11
E-mail	82	12
Hearings (Number of Comment/Submittals)	83	16
Total Submittals	494	72

A.2.2 Public Hearing Format

The public hearings were organized to encourage public comments on the Sodium-Bonded Spent Nuclear Fuel (SBSNF) Draft EIS and to allow two-way interaction between public attendees and DOE representatives. A neutral facilitator was present at each hearing to direct and clarify discussions and comments. A court reporter also was present at each hearing to record the proceedings and provide a transcript of the public comments and the dialogue between the public and the DOE and contractor representatives on hand. These transcripts are available in DOE public reading rooms near each of the proposed sites and in Washington, D.C.

The format used for each hearing included a presentation, question and answer session, and a public comment period. The hearing opened with a welcome from the facilitator, followed by a presentation on the proposed action by a DOE representative. The facilitator next opened the question and answer session to give the audience a chance to ask questions about the material presented. This was followed by the public comment session, during which attendees were given an opportunity to read a prepared statement of no more than five minutes. Modifications to the format were made at each of the public hearings to fulfill the special requests of attendees. Following the public hearings, the comments were identified from the transcripts of each hearing and the comment documents submitted by the attendees.

A.2.3 Comment Disposition

Comments received at the public hearings and via fax, U.S. mail, e-mail, or the toll-free 800-number phone line were divided into ten issue categories to facilitate responses and provide an overview of the type of comments that DOE received. The categories appear in Table A–8 later on in this appendix.

All the comments received during the SBSNF Draft EIS comment period appear in either Section A.2.5 or A.2.6 of this appendix. Section A.2.5 contains a set of tables corresponding to each of the public hearings. Section A.2.6 includes scanned images of the comments received via U.S. mail, e-mail, toll-free phone line,

toll-free fax line, or personal submission at the public hearings. DOE's response to each comment is presented on the opposite side of the page. Transcriptions of the oral comments submitted at each of the public hearings are presented in the appropriate tables, along with DOE's responses to each comment.

Table A–6 is an index of all of the commentors who made statements or submitted comments at the public hearings or during the public comment period, including members of the public, representatives of organizations or agencies, and public officials. Commentors are listed alphabetically by their last name, along with the page on which their comments appear in Sections A.2.5 or A.2.6. **Table A–7** identifies separately Federal, State, and local officials and agencies, companies, organizations and special interest groups that submitted comments. **Table A–8** correlates comment categories with comment identification numbers; thus, permitting the reader to readily locate similarly categorized comments.

Table A–6 Commentors Index

Commentor	*Commentor Number*	*Comment/Response Page Numbers*
David E. Adelman, Natural Resources Defense Council, Washington, DC	36	A-140
Richard Albrecht, Wilson, WY	2	A-76
Anonymous	18	A-112
Anonymous	15	A-92
Anonymous	19	A-113
Robert Bobo, The Shoshone-Bannock Tribes, Fort Hall, ID	55	A-209
Charles Bailey	6	A-80
Julie Bowles, Boise, ID	40	A-148
Jean Boyles	7	A-81
Beatrice Brailsford, Snake River Alliance, Pocatello, ID	706	A-57
Ted L. Carpenter, The Shoshone-Bannock Tribes, Fort Hall, ID	47, 703	A-172, A-54
Ernest S. Chaput, Economic Development Partnership of Aiken and Edgefield Counties of South Carolina, Aiken, SC	13, 504	A-88, A-42
Pat Clark, Snake River Alliance, Boise, ID	5	A-79
John Commander, Coalition 21, Idaho Falls, ID	27, 56, 701	A-125, A-213, A-52
Peter J. Dirkmaat, DOE-ID, Shelley, ID	3	A-77
dpdufur@micron.net	21	A-116
Beth Duke, Sun Valley, ID	20	A-114
Maureen Eldredge, Alliance for Nuclear Accountability, Washington, DC	800	A-59
Nancy Fenn	25	A-122
Dan Freeman	39	A-147
Rick Gheddis	502	A-38
Ellen Glaccum, Ketchum, ID	1	A-73
Kathryn Graves, Hailey, ID	44	A-159
Jeep Hardinge, Ketchum, ID	12	A-87
David Hensel, Driggs, ID	31	A-131
Steve Herring, Idaho Section of ANS, Idaho Falls, ID	704	A-55
Steve Hopkins, Snake River Alliance, Boise, ID	17, 41, 600	A-111, A-149, A-44
Laird Irvin, Ketchum, ID	9	A-83

Commentor	*Commentor Number*	*Comment/Response Page Numbers*
Lowell Jobe, Coalition 21, Idaho Falls, ID	8, 32, 56	A-82, A-133, A-213
Lisa Johnson, Victor, ID	33	A-134
Dan Johnston, Richland, WA	34	A-137
Dick Kenney, Coalition 21, Idaho Falls, ID	702	A-53
David Kipping, Snake River Alliance, Boise, ID	30	A-128
Lisa Ledwidge, Institute for Energy & Environmental Research, Takoma Park, MD	46	A-162
Edwin Lyman, Nuclear Control Institute, Washington, DC	52, 802	A-196, A-68
Susan Mathees, Ketchum, ID	11	A-86
Barbara Mathison, Meridian, ID	54	A-207
Betina Mattesen, Bristol, VT	10	A-84
Patricia McCracken, Augusta, GA	16, 503	A-93, A-39
Don McWhorter, North Augusta, SC	14	A-90
Carol Murphy, Ketchum, ID	35, 37, 39	A-138, A-145, A-147
Susan Pengilly Neitzel, Idaho State Historical Society, Boise, ID	4	A-78
Suzy Nielond, Jackson, WY	38	A-146
Richard Parkin, U.S. Environmental Protection Agency, Seattle, WA	53	A-202
Debra Patla, Victor, ID	48	A-173
Lee Poe, Aiken, SC	500	A-35
Randy Ponic	501	A-37
Bennett Ramberg, Committee to Bridge the Gap, Los Angeles, CA	50	A-185
Charles Rice, INEEL Citizens Advisory Board, Idaho Falls, ID	51	A-191
Matt Smith	23	A-118
Margaret Stewart, Ketchum, ID	42	A-154
John Tanner, Coalition 21, Idaho Falls, ID	26, 705	A-124, A-56
Willie R. Taylor, U.S. Department of Interior, Washington, DC	43	A-157
Marlise Teasley, Twin Falls, ID	45	A-160
Kathleen E. Trever, State of Idaho INEEL Oversight Program, Boise, ID	49	A-177
Doug Turner, Bechtel Jacobs Company LLC, Oak Ridge, TN	22	A-117
Robert H. Wilcox, Martinez, GA	29	A-127
Terry & Theresa Williams, Hailey, ID	28	A-126
Monte Wilson, Potlatch, ID	24	A-120
Hisham Zerriffi, Institute for Energy & Environmental Research, Takoma Park, MD	46, 801	A-162, A-61

Table A–7 Index of Public Officials, Organizations, and Public Interest Groups

Commentor Information	*Document Number*	*Page Number*
Alliance of Nuclear Accountability, Maureen Eldredge, Washington, DC	800	A-59
Coalition 21, Idaho Falls, ID	8, 26, 27, 32, 701, 702, 705	A-82, A-124, A-125, A-133, A-52, A-53, A-56
Committee to Bridge the Gap, Benett Ramberg, Ph.D., Director of Research, Los Angeles, CA	50	A-185
Economic Development Partnership of Aiken and Edgefield Counties of South Carolina, Ernest Chaput, Aiken, SC	13, 504	A-88, A-42
Idaho State Historical Society, Susan Pengilly Neitzel, Deputy State Historic Preservation Officer and Compliance Coordinator, Boise, ID	4	A-78
INEEL Citizens Advisory Board, Charles Rice, Chair, Idaho Falls, ID	51	A-191
Institute for Energy & Environmental Research, Hisham Zerriffi, Project Scientist, and Lisa Ledwidge, Outreach Coordinator, Takoma Park, MD	46, 801	A-162, A-61
Natural Resources Defense Council, David E. Adelman, Project Attorney, Washington, DC	36	A-140
Nuclear Control Institute, Edwin Lyman, Scientific Director, Washington, DC	52, 802	A-196, A-68
Shoshone-Bannock Tribes, Robert Bobo, Project Director, and Ted Carpenter, DOE Project Environmentalist, Fort Hall, ID	47, 55, 703	A-172, A-210, A-54
Snake River Alliance, David Kipping, President, Board of Directors, and Steve Hopkins, Program Assistant, Boise, ID	17, 30, 41, 600, 706	A-111, A-128, A-149, A-46, A-57
State of Idaho INEEL Oversight Program, Kathleen Trever, Coordinator-Manager, Boise, ID	49	A-177
U.S. Department of the Interior, Office of the Secretary, Willie Taylor, Director, Office of Environmental Policy and Compliance, Washington, DC	43	A-157
U.S. Environmental Protection Agency, Region 10, Richard Parkin, Manager Geographic Implementation Unit, Seattle, WA	53	A-203

Table A–8 Comment Categories and Comment Identification Numbers

Comment Categories	*Comment Identification Numbers*
1.0 Purpose, Need for, and Timing of Proposed Action	1-4, 16-26, 16-62, 16-77, 17-2, 25-11, 27-3, 27-5, 31-8, 35-2, 41-2, 41-3, 41-13, 45-2, 46-3, 46-4, 46-7, 46-8, 46-11, 46-13, 47-3, 48-4, 52-3, 52-4, 53-1, 55-4, 55-8, 600-7, 600-8, 600-14, 702-4, 800-2, 800-3, 800-4, 800-6, 801-3, 801-4, 801-7, 801-8, 801-9, 801-11
2.0 Waste Disposition, Waste Acceptance Criteria	10-1, 10-6, 14-1, 14-2, 16-6, 16-8, 16-13, 16-14, 16-22, 16-23, 16-24, 16-27, 16-51, 16-52, 19-1, 20-6, 24-5, 25-2, 25-10, 26-4, 30-7, 31-6, 33-3, 33-10, 35-3, 36-10, 39-5, 41-8, 41-9, 41-11, 42-5, 46-6, 48-6, 49-4, 49-8, 49-24, 49-25, 49-26, 49-28, 49-29, 49-35, 49-36, 51-9, 52-7, 54-3, 55-7, 56-7, 500-6, 600-10, 705-4, 801-2, 801-6, 801-10, 802-3, 802-8
3.0 NEPA and Extension of Public Comment Period	1-1, 1-2, 1-3, 5-1, 7-1, 8-1, 8-3, 9-1, 10-3, 11-1, 12-1, 16-2, 16-3, 16-17, 16-34, 16-35, 16-39, 16-41, 16-44, 16-45, 16-65, 16-78, 19-2, 20-1, 20-2, 21-1, 23-1, 24-1, 25-5, 28-1, 29-1, 29-2, 30-1, 30-2, 30-8, 31-1, 32-1, 33-6, 35-5, 35-7, 36-1, 36-3, 36-4, 36-7, 36-14, 37-2, 38-1, 39-1, 39-2, 41-1, 41-5, 41-7, 42-1, 42-2, 42-6, 42-8, 42-9, 43-3, 44-4, 45-3, 48-10, 49-1, 49-10, 49-12, 49-17, 49-21, 49-31, 49-32, 49-39, 51-1, 51-4, 51-8, 51-10, 52-1, 53-2, 54-5, 55-1, 56-1, 56-12, 503-4, 600-1, 600-2, 600-3, 600-4, 600-6, 600-12, 706-2, 706-3, 800-1, 802-1
4.0 Relationship to other DOE Programs	1-7, 16-19, 16-25, 16-28, 16-29, 16-31, 16-32, 16-40, 16-50, 16-64, 23-2, 23-6, 24-2, 25-6, 29-4, 30-3, 31-2, 33-7, 35-6, 41-4, 41-12, 42-7, 44-2, 45-1, 46-5, 46-10, 49-5, 49-6, 49-27, 51-7, 54-6, 54-10, 503-1, 702-3, 801-5, 802-4

Comment Categories		Comment Identification Numbers
5.0	Out of Scope - Cost	10-4, 13-5, 15-1, 16-7, 16-9, 16-11, 16-12, 16-20, 16-30, 16-42, 16-43, 16-46, 16-48, 16-49, 16-55, 16-57, 16-58, 16-59, 20-5, 23-4, 25-4, 25-8, 29-3, 29-6, 30-5, 31-4, 31-9, 32-2, 33-4, 36-8, 36-9, 36-12, 37-4, 39-4, 40-2, 42-4, 48-8, 51-5, 54-4, 54-8, 56-3, 56-4, 56-5, 56-6, 504-4, 600-15, 700-1, 802-2
6.0	Out of Scope - Nuclear Nonproliferation Policy	10-2, 17-1, 20-4, 23-5, 24-4, 25-3, 25-9, 26-3, 27-4, 30-6, 31-5, 31-7, 33-5, 33-9, 35-4, 41-6, 41-15, 44-1, 46-1, 46-16, 46-17, 46-18, 46-19, 46-20, 46-21, 46-22, 48-3, 50-1, 51-6, 52-8, 52-9, 52-10, 52-11, 52-12, 52-13, 52-14, 54-2, 54-9, 56-11, 501-1, 600-5, 600-13, 600-17, 700-3, 701-3, 801-12
7.0	Technologies (Technical Issues)	13-4, 14-3, 14-4, 14-5, 16-10, 16-15, 16-16, 16-18, 16-36, 26-1, 34-2, 36-5, 46-2, 46-9, 46-12, 47-1, 49-7, 49-9, 49-37, 55-5, 55-6, 500-5, 504-3, 700-2, 703-1, 705-1, 705-2, 802-5
8.0	Alternatives (NEPA-Related Issues)	2-1, 3-2, 6-1, 13-1, 13-2, 13-3, 16-21, 16-33, 18-1, 20-3, 22-1, 24-6, 24-7, 26-2, 27-1, 27-2, 28-2, 29-5, 33-2, 35-1, 36-6, 36-11, 36-13, 37-1, 39-3, 40-1, 41-10, 41-14, 44-3, 46-23, 48-1, 49-2, 51-2, 51-3, 52-5, 54-1, 55-2, 55-9, 56-2, 56-8, 56-9, 56-10, 500-2, 500-3, 500-4, 504-5, 502-1, 504-1, 504-2, 600-16, 600-18, 600-19, 701-1, 701-2, 701-4, 702-2, 704-1, 705-5, 706-1, 801-1, 802-6, 802-7
9.0	Affected Environment/Environmental Consequences	1-5, 1-6, 1-8, 3-1, 4-1, 16-1, 16-4, 16-5, 16-37, 16-38, 16-47, 16-53, 16-54, 16-56, 16-60, 16-61, 16-63, 16-66, 16-67, 16-68, 16-69, 16-70, 16-71, 16-72, 16-73, 16-74, 16-75, 16-76, 23-7, 33-1, 34-1, 40-3, 43-1, 43-2, 43-4, 46-14, 46-15, 47-2, 48-7, 48-9, 49-3, 49-11, 49-13, 49-14, 49-15, 49-16, 49-18, 49-19, 49-20, 49-22, 49-23, 49-30, 49-33, 49-38, 49-40, 49-41, 49-42, 49-43, 52-6, 53-3, 53-4, 53-5, 53-6, 53-7, 53-8, 53-9, 55-3, 500-1, 503-3, 503-5, 702-1, 703-2, 800-5
10.0	Out of Scope - Other	10-5, 21-2, 23-3, 24-3, 25-7, 30-4, 31-3, 33-8, 36-2, 42-3, 48-11, 54-7, 503-2, 600-9, 600-11

A.2.4 Issues Raised During the Public Comment Period

Four hundred and ninety-four comments were received during the public comment period. Most of the comments focused on the following: (1) the purpose, need for, and timing of the proposed action; (2) the introduction of new waste forms produced by the proposed action, their acceptability in a geologic repository, and the disposition of uranium and plutonium by-products; (3) the public availability of information considered relevant to reviewing the draft EIS, the extension of the comment period, and the relationship of the EIS to other DOE programs; (4) the cost of the various alternatives; (5) the impacts of the proposed action on U.S. nuclear nonproliferation policy; (6) technical and/or NEPA-related questions regarding technologies and alternatives; and (7) questions related to the affected environment and the environmental consequences. DOE's responses to these issues are summarized below. The comments also dealt with a number of other subjects, including technologies considered and dismissed from further evaluation, long-term (beyond institutional control) performance of the sodium-bonded spent nuclear fuel during storage on site, and questions on the methodology and assumptions of the health and safety analysis. Many commentors expressed their opposition or support for DOE's action in general or for specific alternatives under the proposed action or the No Action Alternative. Section A.2 of Appendix A provides DOE's responses to all comments on a comment-by-comment basis.

Purpose, Need for, and Timing of the Proposed Action

Many comments expressed the opinion that DOE failed to demonstrate the purpose and need for the proposed action or to provide a rationale for its timing. Some of the reasons given included the lack of a compelling argument that there is a safety risk associated with current storage; the lack of a regulatory framework and final waste acceptance criteria; the lack of an approved site for a geologic repository; insufficient information on the results of the Electrometallurgical Treatment Research and Demonstration Project; and the lack of analysis showing that direct disposal of the sodium-bonded spent nuclear fuel without sodium removal would be detrimental to the performance of the geologic repository.

DOE's position as presented in the EIS is that the need to examine options for the management and treatment of sodium-bonded spent nuclear fuel is based on the existing regulatory environment concerning long-term disposal of spent nuclear fuel and high-level radioactive waste. It is assumed that DOE's sodium-bonded spent nuclear fuel, as well as other DOE-owned spent nuclear fuel, eventually will be disposed of in a geologic repository. One of the key requirements, as specified in the current April 1999 version of the DOE'S *Waste Acceptance Systems Requirements Document* and in the U.S. Nuclear Regulatory Commission requirements for acceptance of spent nuclear fuel or high-level waste in a geologic repository, is that it cannot contain or generate materials that are explosive, pyrophoric, or chemically reactive in a form or amount that could compromise the repository's ability to perform its waste isolation function or to satisfy its performance objective (10 CFR 60.135(b)(1)). The sodium-bonded spent nuclear fuel, if left in its existing state, would contain pyrophoric and chemically reactive metallic sodium and, therefore, would not likely meet DOE or U.S. Nuclear Regulatory Commission repository acceptance criteria.

The timing for the proposed action is a programmatic issue rather than a safety issue. The EIS does not conclude that current storage of sodium-bonded spent nuclear fuel presents a threat to the health and safety of workers or the public. The programmatic risk associated with implementing the proposed action or not treating the sodium-bonded spent nuclear fuel is the uncertainty surrounding the acceptability of this fuel for placement in a geologic repository. The process of establishing a repository is dependent on not only the site but also the materials to be disposed of. As part of this process, a total system performance assessment that describes the probable behavior of a repository is performed. This total system assessment includes the performance of the specific waste forms and inventories proposed for disposal. As part of the process of establishing a repository, data for the waste forms are needed prior to making a final selection of the repository, not after. In fact, if specific waste forms are not represented in crucial documents like this EIS, additional documentation will be needed to allow for the possibility of disposing of those materials in the repository. The performance of sodium-bonded spent nuclear fuel in a geologic repository depends on many factors (e.g., long-term fuel integrity, repository environment fuel/waste package survivability, etc.), and the presence of metallic sodium would complicate the modeling even further. Stabilization of the spent nuclear fuel and/or removal of the metallic sodium would provide greater protection for human health and the environment.

The Electrometallurgical Treatment Research and Demonstration Project began in June 1996 and, although the review of the test results has not been finalized in a single report, a number of status reports were issued by DOE and reviewed by the National Academy of Sciences' National Research Council Committee. They are referenced in the EIS. The success criteria established at the outset of the project have been fulfilled. The environmental impact analysis associated with the electrometallurgical treatment process alternatives was based on actual data from the demonstration project. The final EIS includes a new section on the status and results of the project. Having completed the demonstration project and in planning the closure of its PUREX processing capabilities, DOE now needs to decide whether these processes are suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in a loss of

capability and of experienced, knowledgeable technical staff, should DOE decide at a later date to use the electrometallurgical process to treat the sodium-bonded spent nuclear fuel.

New Waste Forms and Disposition of Uranium and Plutonium By-Products

Some of the comments questioned the generation of new waste forms from treating the sodium-bonded spent nuclear fuel and the possible acceptance of these forms in a geologic repository. Also, a number of commentors remarked on the generation of uranium and plutonium as by-products of the treatment process. Related issues were the disposition of uranium metal, a by-product of the electrometallurgical process, and the compliance of both the PUREX and the electrometallurgical process with U.S. nuclear nonproliferation policy in terms of the separation of these elements.

All of the alternatives evaluated in this EIS would produce some form of high-level radioactive waste. Electrometallurgical treatment would produce two new waste forms (metallic, ceramic) and the melt and dilute process would produce a new metallic form (i.e., melt and dilute product or conditioned spent nuclear fuel). These forms would be more stable than the untreated sodium-bonded spent nuclear fuel. The ceramic and metallic waste forms generated during the electrometallurgical treatment process represent chemically stable materials compared to untreated sodium-bonded spent nuclear fuel. The production of a chemically stable waste form to replace a chemically reactive waste form (i.e., sodium-bonded spent nuclear fuel) represents an improvement in the safe, long-term storage of this spent nuclear fuel. DOE expects the new waste forms to be suitable for disposal in a repository and to meet the requirements of the final waste acceptance criteria. The high-level radioactive waste form resulting from the PUREX process is borosilicate glass, which has been extensively tested and analyzed under conditions relevant to a geologic repository.

With respect to uranium and plutonium disposition, the EIS states that only uranium that would be separated under the electrometallurgical process would be blended down and stored on site if it originates from driver spent nuclear fuel, or would be stored on site as depleted uranium if it originates from blanket spent nuclear fuel. The final disposition of the stored uranium has not been decided and is not discussed in the EIS. The disposition of the uranium will be subject to a separate NEPA review. The nuclear nonproliferation policy aspects of this separation is subject to the nuclear nonproliferation policy assessment of the alternatives. The approximately 260 kilograms (575 pounds) of plutonium that would be separated under the PUREX process would be disposed of in accordance with the Record of Decision (65 FR 1608) for the *Surplus Plutonium Disposition Environmental Impact Statement* (DOE/EIS-0283) issued in November 1999. This separation is the subject of the nuclear nonproliferation assessment, which is independent of this EIS.

Public Availability of Information and Related Documentation

Many commentors asked for a 60-day extension of the 45-day public comment period on the draft EIS. Commentors said they wanted additional time to obtain and review relevant documents such as the Yucca Mountain Draft EIS and the National Academy of Sciences' National Research Council's final report on the Electrometallurgical Treatment Research and Demonstration Project, as well as the Cost Study and Nonproliferation Impacts Assessment. The comments frequently stated that DOE needs to make all of this information publicly available before the end of the EIS comment period and the issuance of the final EIS and the Record of Decision.

In an effort to ensure that all interested parties had time to comment on the draft EIS, the due date for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169). With respect to the need for more information, DOE made that information available to the public. Background materials were placed in public reading rooms and were made available to the public through a series of hearings held August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho;

August 26, 1999, in Idaho Falls, Idaho; and August 31, 1999, in Arlington, Virginia. Materials placed in the reading rooms included the electrometallurgical demonstration environmental assessment, the Finding of No Significant Impact for the environmental assessment, National Research Council reports, the 1995 Settlement Agreement and Consent Order with the State of Idaho, the scoping meeting transcripts and comments, and the draft EIS hearing presentations and fact sheets. In addition, completion of the Cost Study and Nonproliferation Impacts Assessment was expedited so that they would be available to the public at the beginning of the comment period. These reports were mailed to interested parties on August 12, 1999, and were made available to attendees at all of the public hearings on the draft EIS. Although these reports are not critical to the evaluation of the analysis presented in the draft EIS, they will provide input to the Record of Decision. While the final National Research Council report on the demonstration project was published in April 2000, interim status reports were produced throughout the project. Data generated during the demonstration project were used in preparing the EIS.

Cost Issues

A number of commentors raised cost issues and provided comments directly related to the Cost Study, which was not part of the EIS.

Comments concerning the costs of the proposed action were considered beyond the scope of the EIS. The EIS was prepared in accordance with NEPA, as well as the Council on Environmental Quality's regulations on implementing NEPA (40 CFR 1500 through 1508) and DOE's NEPA regulations (10 CFR 1021). None of these regulations require the inclusion of a cost analysis in an EIS. The basic objective of the SBSNF EIS is to provide the public and DOE decision-makers with a description of the reasonable alternatives for treating and managing sodium-bonded spent nuclear fuel and information about their potential impacts on public health and safety and the environment. While cost could be an important factor in the ultimate Record of Decision, the purpose of this and other EISs is to address the environmental consequences of the proposed action and the No Action Alternative. DOE distributed cost information through the independent Cost Study released in August 1999, and this information is available to the public on request and in the DOE's public reading rooms. Responses to specific comments related to cost issues are included in Sections A.2.5 and A.2.6 of this appendix.

Nuclear Nonproliferation Policy Issues

The nuclear nonproliferation implications of the proposed action were the subject of a number of comments. Some commentors expressed strong opinions about how the use of specific technologies such as electrometallurgical treatment might impact U.S. nonproliferation policy.

Nonproliferation is another issue that was considered beyond the scope of the EIS. A separate Nonproliferation Impacts Assessment was prepared by DOE's Office of Arms Control and Nonproliferation. After assessing the potential nonproliferation impacts that may result from each of the alternatives and technologies analyzed in the SBSNF Draft EIS, the Office of Arms Control and Nonproliferation found that all the alternatives, except that involving PUREX processing at Savannah River, are fully consistent with U.S. policy concerning reprocessing and nuclear nonproliferation. Electrometallurgical treatment, for example, would not increase national inventories of weapons-usable fissile material because, although highly enriched uranium is an interim product of the process, it would be blended down to low-enriched uranium during treatment. Within the current equipment configuration and design, it is not possible to produce weapons-usable plutonium merely by adjusting the operating parameters. To do this, traditional aqueous processing would be required after electrometallurgical treatment. However, traditional aqueous processing could be used to produce weapons-usable plutonium directly from the spent nuclear fuel, without electrometallurgical treatment, so electrometallurgical treatment itself does not present a special proliferation

concern. Responses to specific comments related to nonproliferation are included in Sections A.2.5 and A.2.6 of this appendix.

Technologies, Alternatives

Various comments dealt with technical questions and issues regarding the treatment technologies addressed in the EIS or NEPA-related issues regarding the selected alternatives.

The variety of the issues precludes a summary response. Responses to these questions on a comment-by-comment basis are included in Sections A.2.5 and A.2.6 of this appendix. A number of the responses indicate that revisions to the EIS were made as a result of the comments.

Affected Environment and Consequences

A number of comments included questions concerning the description of the affected environment in the SBSNF Draft EIS, and the results of the environmental impact analysis.

As in the case above, responses to these comments on a comment-by-comment basis are included in Sections A.2.5 and A.2.6 of this appendix.

A.2.5 Public Hearing Comments and DOE Responses

Comments presented in this section were submitted during oral presentations at the public hearings held on August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho; and August 31, 1999, in Arlington, Virginia. DOE's responses to these comments are also presented.

Comments from the North Augusta, South Carolina, Public Hearing August 17, 1999		
No.	***Comment***	***DOE Response***
Lee Poe		
500-1	"In your charts you show the maximum potential radiological impacts...that the PUREX process has those rates that exceed background. It just seems unreasonable...knowing the canyons and their operations like they do. Would you explain how you got a dosage of one and a half times background?" *[The commentor is referring to DOE's presentation of the worker dose at SRS of 500 millirem per year compared to a background dose of 360 millirem per year.]*	The average SRS worker dose used to evaluate environmental impacts is routinely assumed to be 500 millirem per year. This dose value is conservative and has been published in numerous environmental impact statements on SRS. As indicated in Section E.4.3 of the EIS, this average worker dose estimate was also used in the SRS Spent Nuclear Fuel Management EIS for activities similar to those described in this SBSNF EIS.
500-2	"I notice that when you showed the pictures of the alternatives, all but one of the drivers are processed through the electrorefining process at INEEL ANL-West. That was a surprise to me, that there were no other alternatives other than the melt and dilute."	Technologies such as GMODS and the direct plasma arc-vitreous ceramic processes have the potential to be used to treat driver sodium-bonded spent nuclear fuel. However, as discussed in Section 2.6 of the EIS, these technologies are less mature than those evaluated in detail in the EIS.
500-3	"If we've got a technology that's marginal, is there something out there that will mature in the next 10 years that would allow that material to be processed? ...I think that's an issue you need to address more than what I saw. Now, maybe it's addressed in there, but what I saw was those alternatives were fairly written off."	As discussed in Section 2.5.1, the EIS evaluates two options under the No Action alternative: (1) direct disposal of the sodium-bonded spent nuclear fuel without sodium removal, and (2) continued storage until 2035 in its current location or until a technology, currently dismissed as less mature, is developed. From an environmental point of view, the development of a promising technology could require a considerably long time (20 to 30 years) and would still have to be viable to complete treatment of all or part of the sodium-bonded spent nuclear fuel before 2035.

Comments from the North Augusta, South Carolina, Public Hearing August 17, 1999		
No.	***Comment***	***DOE Response***
500-4	"The one thing that's different in the No Action is that you didn't analyze failure of the material...as spent fuel storage...way out into the future as the repository has done for that material. And if you don't bury it.... If it doesn't go to the mountain and stays at Idaho or wherever, you know, wherever DOE wants to put it, what's the consequence of No Action? And I would think that ought to be more clearly analyzed in the document."	Normal operation radiological effluent from potential fuel degradation during storage at INEEL up to 2035 is evaluated under the No Action Alternative in Section 4.2 of the EIS. As discussed in revised Section 2.5.1 of the EIS, a fundamental assumption made under the No Action Alternative is that sodium-bonded spent nuclear fuel would be disposed of in a repository along with the rest of the DOE-owned spent nuclear fuel within a finite period of time while under the institutional control of DOE. This EIS covers a time period up to 2035, at which time sodium-bonded spent nuclear fuel stored in Idaho would have to be transported out of the state and either stored or treated at another DOE site. For such an eventuality, additional NEPA documentation would be required. The unlikely scenario that treated sodium-bonded spent nuclear fuel would remain at its current site beyond 2035 because there is no geologic repository to accept it has been evaluated as part of the No Action Alternative in the Yucca Mountain Draft EIS, which was issued by DOE in July 1999. The Yucca Mountain EIS is discussed in Section 1.6.2.2.
500-5	"I think of melt and dilute as being a process that you need to isotopically dilute the uranium in the driver fuel. I wonder why you call it melt and dilute. It would seem like to me it's melt and—you know, it's not melt and dilute, then, so you ought to call it by a name that's appropriate. I understand that it's using the equivalent. You may be saying dilute it with aluminum but, you know, that's not clear to the — to the reader from the EIS as to what it is that makes it called melt and dilute."	The melt and dilute process described in the EIS is consistent with the general definition; i.e., it produces a larger volume and a lower concentration by adding material fillers (aluminum, stainless steel, or uranium metal).

Comments from the North Augusta, South Carolina, Public Hearing August 17, 1999		
No.	***Comment***	***DOE Response***
500-6	"I'm terribly disappointed to see that the progress of getting disposal criteria, Waste Acceptance Criteria, for the various fuel other than the commercial power reactor fuel has been almost nonexistent. It certainly appears from reading the Yucca Mountain EIS that...the high-level waste is...way ahead of the government spent nuclear fuel, our stepchildren, and they don't have...anybody there driving it....I would encourage the DOE folks to get out there and to get the DOE spent nuclear fuel, whatever it takes, to get the WAC requirements for those. And if that means a different level of treatment than we're all thinking about or if it means something else, then we ought to be working in that direction. Let's don't stabilize it twice. Let's don't do it now and then turn around 10 years from now and, when it comes time, they open the mountain and all of a sudden they say, 'Ah, you don't have any requirements for that.' So to the DOE folks, let me encourage you to do whatever you can to force RW into working with you to get specifications for waste disposal."	The borosilicate glass waste form for the PUREX alternative has been extensively tested and analyzed under conditions relevant to a geologic repository. One objective of the Electrometallurgical Treatment Research and Demonstration Project was to characterize the electrometallurgical treatment waste forms to facilitate their acceptability in a geologic repository. To ensure the treatment option that might be selected by DOE would produce a product that is likely to meet the acceptance criteria, DOE is working with the National Research Council to obtain comments on the research and development activities DOE will perform to establish treatment technology specifications. The EIS discusses the status of the waste acceptance criteria in Section 2.7 and the environmental impacts of the No Action Alternative in Section 4.2. The timing of DOE's decision on the treatment and management of sodium-bonded spent nuclear fuel in relation to the availability of a geologic repository is discussed in Section 4.12.2.
Randy Ponic		
501-1	"I was looking at the nonproliferation study to support this and one of the comments was they found the canyon operations in this report to be somewhat inconsistent with nonproliferation policy. Yet, in a similar report that was done for the melt and dilute process, they did not find that inconsistency. They found that the canyon operations would be consistent with policy. And using this report actually biases the canyon operations as far as this alternative. So that needs to be addressed, why there's reliance here and not in the previous report that was done for dealing with clad fuels."	The assessment of nonproliferation impacts is not part of the scope of the EIS. However, the "Nonproliferation Impact Assessment for the Management of the Savannah River Site Aluminum-Based Spent Nuclear Fuel" stated that use of conventional reprocessing (PUREX processing) to mitigate safety and health vulnerabilities is consistent with U.S. policy on plutonium reprocessing and the use of plutonium. Since safety and health vulnerabilities do not currently exist for the sodium-bonded spent nuclear fuel, use of conventional reprocessing (PUREX) in this case is somewhat inconsistent with U.S. nonproliferation policy. In this instance, the inconsistency would be due to the generation of potentially usable weapons-grade plutonium. The plutonium product from PUREX processing would be addressed by the Surplus Plutonium Disposition EIS.

Comments from the North Augusta, South Carolina, Public Hearing *August 17, 1999*		
No.	***Comment***	***DOE Response***
Rick Gheddis		
502-1	"It seems ... strange that the melt and dilute at SRS is not applied for the driver fuels. Its design is an HEU treatment process, yet you're applying it only on the blanket fuels, which are depleted uranium, and it's not particularly well suited for depleted uranium operations. Therefore, I'd like to make a comment that you consider an alternative of melt and dilute on the driver fuels at SRS. And by the way, I'd like to see that paired up with the PUREX processing of the blanket fuels, see that as an area of alternative...the blanket fuels match up very well with the PUREX processing."	The commentor's preference for the treatment of both driver and blanket sodium-bonded spent nuclear fuel at SRS is noted. As a result of the commentor's remarks, the possibility of using the melt and dilute process at SRS to treat sodium-bonded driver spent nuclear fuel was considered. See revised Section 2.6 of the EIS for a discussion on why this alternative was dismissed from further evaluation.

Comments from the North Augusta, South Carolina, Public Hearing *August 17, 1999*		
No.	***Comment***	***DOE Response***
Patricia McCracken		
503-1	"One of the things that really...struck me about this EIS...was that there seems to be a predecisional legal agreement that the DOE has made with Idaho, and that decision really preempts the EIS. And it really makes the DOE not have a national environmental policy, but rather is, in the case of Idaho, setting a precedent to look at a waste before you have the EIS or before there's some comment or where people have an opportunity to comment at all on it. So I think that's one of the things that this—this has really struck me as...being not a national policy. I hope I can get some more information on that case, and really that was a comment that should have been included in the EIS."	DOE is responsible for developing and maintaining a capability to safely manage its spent nuclear fuel. As stated in the introduction to the EIS, the SBSNF EIS follows the June 1995 Record of Decision (60 FR 28680) for DOE's Programmatic Spent Nuclear Fuel EIS, in which DOE decided to regionalize spent nuclear fuel management by fuel type for DOE-owned spent nuclear fuel. DOE also decided to: (1) continue environmental restoration activities at INEEL; (2) develop cost-effective treatment technologies for spent nuclear fuel and waste management; and (3) implement projects and facilities to prepare waste and treat spent nuclear fuel for interim storage and final disposition. This Record of Decision provides the programmatic umbrella for the site-specific actions addressed in the SBSNF EIS, as well as the Savannah River Spent Nuclear Fuel Management EIS and the Idaho High-Level Waste and Facilities Disposition EIS. The Savannah River Spent Nuclear Fuel Management EIS evaluates the impacts from the treatment of aluminum-clad and other spent nuclear fuel designated for treatment at SRS. The Idaho High-Level Waste Draft EIS evaluates the impacts from processing specific amounts of calcined high-level and sodium-bearing radioactive waste material currently located at INEEL. The materials (spent nuclear fuel and high-level radioactive waste) addressed in these EISs have unique characteristics and requirements which necessitate their separate evaluation. In a related action alluded to by the commentor, in a 1995 agreement with the State of Idaho (the Settlement Agreement and Consent Order issued on October 17, 1995), DOE committed to removing all spent nuclear fuel from Idaho by 2035. More than 98 percent of DOE's sodium-bonded spent nuclear fuel is located at INEEL and is subject to the requirements of this Settlement Agreement and Consent Order. Copies of the Settlement Agreement and Consent Order were made available to the public at the public meetings and are also located in the public reading rooms, and in Appendix K of the EIS.

Comments from the North Augusta, South Carolina, Public Hearing *August 17, 1999*		
No.	***Comment***	***DOE Response***
503-2	"I've commented, even in Nevada, mainly about how small business could be incorporated into some of these...various processes. And I did get a copy of the cost report and reviewed your references. We would certainly like in our area to get a volunteer group together and possibly make some phone calls along with the people that your agency is calling. I think your contractor and his procurement process has a very narrow group of people in which personal communication—I mean, I just felt like some of this was not documented real well and hope we can work with y'all [*sic*] later. And we have some small businesses that would certainly like to have a chance, whatever you decide to do, that we can also give you some of the cost here. If we could get some specifications which I think are lacking in the EIS, I have commented more on that. Who do we contact...in terms of maybe expanding your base of phone calls in terms of...I noticed you called the U.S. Tool and Die on their cost to fabricate C-22, some kind of pipe. Maybe we could do that too. You think we could call some of our people? Who would I contact at your agency so that we could get some volunteer calling going on in our area? We'd like to have some business here. When some of the people here say they think they can do some processes, I hope you'll look at that. I think they have given some excellent presentations at the meetings I've been to and I've been very impressed with them. I think I heard we can do it back here. So I hope y'all [*sic*] do look at some of the other technical issues."	Contacts with the businesses identified in the Cost Study were made to get estimates that were used for comparative purposes in the Cost Study. These contacts were not part of a procurement process.

Comments from the North Augusta, South Carolina, Public Hearing August 17, 1999		
No.	***Comment***	***DOE Response***
503-3	"I think your computer model is lacking in those numbers in terms of health effects because, without the technology, I don't know how you could decide what the numbers are in many cases."	The GENII computer program used to estimate the human health effects from releases of radioactive material during normal operation and accidental conditions is a well-known program, and its applicability has been demonstrated in various DOE EISs. The program models the dispersion of releases and calculates potential doses to the public and individuals residing in the vicinity of the facility. All required input to this program is well defined and the process is well understood. The evaluation is independent of the technology and equipment used. The only input from each process to this program is the quantity of radioactive material released during normal and accident conditions. As explained in the response to comment 16-47, the releases were estimated based on facility safety analysis reports. The atmospheric dispersion of radioactive material releases vary depending on the type and duration of the release. The selection of a dispersion model is an input to the GENII computer program. The dispersion models used in the program are well defined and are explained in Appendix E. These models are independent of the technologies used. The expression "new environmental equipment" is not used in the EIS and new environmental equipment is not related to the use of a computer program. Contamination in the off-gas system filters originates from the process. Each process is well defined. For example, because of the high temperature used in the melt and dilute process, some radionuclide elements with boiling temperatures below the process temperature would evaporate, while some elements would be oxidized and released to the off-gas system. The gaseous flow through the off-gas system first would be condensed and adsorbed, and then would be filtered before entering the atmosphere. All noble gases would pass through the filters, but only a small fraction of particulates would pass through the filters. The specific assumptions on various filtration factors are given in Appendix E and Appendix F. These appendices also provide the source terms associated with each of the releases considered.
503-4	"I've been very impressed with the EISs at Savannah River. And I've reviewed some of this and I hope I can continue to... give comment on this."	The commentor's statement concerning EISs at SRS is noted. DOE welcomes comments on all of its NEPA actions.
503-5	"Well, I disagree totally with it by the way your computer models and how they.... I would...really like to look at how they got those numbers." *[Commentor refers to computer modeling of PUREX wastewater discharges]*	PUREX at SRS is the only treatment that would result in discharges of radionuclides or nonradioactive hazardous chemicals to surface water. The major sources of this liquid effluent would be process cooling water and steam condensate from the auxiliary facilities that support PUREX processing. As described in Section 4.5.2, the mechanism associated with releases of liquid effluent from PUREX processing is essentially independent of the type of fuel processed. The released quantities are the measured values provided in the SRS Site Environmental Report for 1997.

Comments from the North Augusta, South Carolina, Public Hearing *August 17, 1999*		
No.	***Comment***	***DOE Response***
Ernest Chaput		
504-1	"I want to congratulate the Department for recognizing the need to develop a disposition strategy for this fuel which is intended to go to Yucca Mountain. We all hope Yucca Mountain comes out. I know this is a direct issue for the draft EIS on Friday and so that's — that's a very big step. We congratulate you for trying to recognize your responsibility, nuclear responsibility, to safely disposition the fuels that were left over now that the Cold War is won and other nuclear programs ...are being shut down and other programs are taking over the cleaning up that you've done. We believe, from...my understanding of the waste acceptance criteria of the draft, that some kind of a treatment will be mandatory, and so we commend you for doing that."	The commentor's expressed support for DOE's action to proceed with an EIS for the treatment and management of sodium-bonded spent nuclear fuel is noted. In accordance with the Nuclear Waste Policy Act of 1982, DOE is committed to the development of a licensed national repository for spent nuclear fuel and high-level radioactive waste and is engaged in activities to fulfill this commitment. A Yucca Mountain Draft EIS was issued by DOE in July 1999.
504-2	"...we notice that, as you pointed out, two of the six alternatives included in the draft include the shipment of the blanket materials to Savannah River for treatment either by the PUREX process or by the proposed melt and dilute facility. As a policy in my organization, we do not support the shipment of waste materials to Savannah River unless it can be clearly demonstrated that Savannah River has a significant capability or advantage to perform the task which cannot be reasonably established at the generated site. In other words, don't bring your waste to South Carolina unless you can clearly demonstrate you can't handle it somewhere else, particularly, preferably, the generating site."	The commentor's objections to the shipment of spent nuclear fuel to SRS for treatment is noted. The selection of reasonable alternatives evaluated in the EIS was made in accordance with Council on Environmental Quality Regulations (40 CFR 1500-1508) and DOE's NEPA-related regulations (10 CFR 1021) and procedures. In addition, as discussed in Section 1.3 of the EIS, the selection of reasonable alternatives was done in response to the issues raised during the public scoping period.

Comments from the North Augusta, South Carolina, Public Hearing August 17, 1999		
No.	***Comment***	***DOE Response***
504-3	"...if the Department determines that the shipment of blanket elements to the Savannah River Site is in the national interest, then we strongly recommend that only the PUREX treatment option be considered. Our reasons are twofold: One, PUREX is currently operational. The big concern, our big fear in South Carolina, is people ship us waste that eventually ends up being untreatable or it doesn't get treated at all and ends up resident in South Carolina. We want a clear path of any waste coming into the state, we want a path going out. And that path is the PUREX-DWPF-National Repository. The proposed melt and dilute facility is currently in development. The waste forms have not been extensively reviewed for acceptance in the national repository. The program is underfunded, potentially behind schedule. The inclusion of this material will further complicate its process development and facility operation. And...there is no assurance that the product form will be ultimately accepted into the National Repository and so, therefore, we...our strong recommendation is, if you do consider Savannah River, canyons is the only thing that my organization personally finds acceptable."	The commentor's preference for using PUREX processing instead of melt and dilute at SRS is noted. The final decision on the process to be selected for treating the sodium-bonded spent nuclear fuel will be based on the impacts provided in this EIS along with the conclusions presented in the Cost Study and Nonproliferation Impacts Assessment. The commentor is correct that the melt and dilute process at SRS is currently under development. However, based on recent research and development activities, preliminary conceptual design work, and technical maturity, DOE considers melt and dilute to be a viable technology option that can be implemented at SRS or ANL-W. DOE expects the waste generated from this process would meet the geological repository acceptance criteria.
504-4	"If it does come to the canyons, it has to come with adequate budgetary resources. We've got lots of other important missions on this site and we've got to make sure they...are carried on also. And so we would expect or require a firm DOE commitment for incremental funding....And if Savannah River capabilities are being considered, then only PUREX should be considered and then only if additional—adequate funding is provided."	If DOE selects Alternative 3 in the Record of Decision, use of the F-Canyon at SRS for blanket spent nuclear fuel treatment would not begin without the assurance of adequate funding. However, Congress determines how funds are allocated. DOE spends monies consistent with Congressional direction. DOE is not in a position to make the difficult tradeoffs that may be required between alternative Federal programs and spending priorities. The issue of funding for the treatment and management of sodium-bonded spent nuclear fuel is beyond the scope of the SBSNF EIS.
504-5	"The draft EIS identifies the electrometallurgical facility which currently exists at Argonne-West and...it initially appears...that [facility] can meet that criteria."	As discussed in Section 2.4.1 and 2.5.2 of the EIS, with a few equipment modifications, existing facilities at ANL-W would be suitable to accommodate the electrometallurgical treatment of sodium-bonded spent nuclear fuel.

Comments from the Boise, ID, Public Hearing *August 24, 1999*		
No.	*Comments*	*DOE Responses*
Steve Hopkins		
600-1	"I would like to see the comment period extended since the nonproliferation and cost reports have just been released."	In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169). This extension also provided additional time for public review of the Cost Study and Nonproliferation Impacts Assessment. However, it should be noted that comments related to these reports are not within the scope of the EIS.
600-2	"Even though it is realized that these [nonproliferation and cost] reports are not part of the NEPA process, it is the only chance for the public to comment on them."	As noted by the commentor, although the Nonproliferation Impacts Assessment and Cost Study are not part of the NEPA process, the public may comment on them during the comment period for the draft EIS. In fact, DOE expedited the completion of these reports so that they would be available to the public to review in conjunction with the draft EIS. These reports were mailed to interested parties on August 12, 1999, and were made available to attendees at all of the public hearings on the draft EIS. DOE also extended the comment period from September 13 to September 28, 1999, (64 FR 49169) to provide the public with additional time to make comments.
600-3	"This is the public's only opportunity to comment, and you're starting an environmental impact statement process before having the final results [of the demonstration project] in. The demonstration project that you made, you have got enough already to do your draft EIS, but the public has to be taken into account in terms of it [how] should be completed before moving on with an EIS. The purpose was to demonstrate that it could work. It's called a demonstration project. And you're moving forward, analyzing an alternative that the public doesn't have any data [on] at this point in terms of the results."	The Electrometallurgical Treatment Research and Demonstration Project was successfully completed in August 1999, and the final results of the National Research Council's independent review of the project was published in April 2000. The commentor is correct in stating that DOE used the results of the demonstration project in preparing the draft EIS. Information available on the demonstration project includes the environmental assessment, published in 1996, as well as a series of independent status reports published by the National Research Council. This information was placed in the public reading rooms and, thus, was made available to the public.
600-4	"I understand there's a second comment period after the Final [EIS] is issued with the preferred alternative. However, it's, like, 99 percent of the time or greater that when you have a preferred alternative that's what's [*sic*] the Record of Decision. So you can argue that you can have a public comment period, but the comments are not taken into consideration. Supposedly, in this process, you're factoring in the public's comments to make your preferred alternative, although you can argue you're not doing that at all."	Although the NEPA process does not provide a formal comment period with public hearings following publication of the final EIS, DOE welcomes comments. These comments can be made during the 30-day period between publication of the EIS and issuance of the Record of Decision. DOE considered all of the comments received during the public comment period on the draft EIS. Public comments are one of several factors considered in identifying a preferred alternative. The selection of a method for treating and managing DOE's sodium-bonded spent nuclear fuel will be published in the Record of Decision. Factors taken into consideration when making that decision include the analyses presented in the EIS, public comments, cost, schedule, technical assurance, policy, and program objectives.

Comments from the Boise, ID, Public Hearing *August 24, 1999*		
No.	*Comments*	*DOE Responses*
600-5	"...at one point in this [Electrometallurgical treatment] process you're separating out highly enriched uranium. That's reprocessing. That may not be a final waste stream, but it's a reprocessing technology for separating out highly enriched uranium.... [*in response to a presenter's statement that the nonproliferation report concludes that electrometallurgical treatment is in compliance with all of the U.S. nonproliferation goals and policy*]...That's bunk. It's a reprocessing technology ....The Department of Energy has conveniently reworked the definition of reprocessing to fit the situation, so it's not technically reprocessing under the new definition. But under the definition of what reprocessing does, this is absolutely reprocessing."	The assessment of nonproliferation impacts is not part of the scope of the EIS. However, none of the alternatives analyzed in this EIS, except PUREX processing at SRS, would generate weapons-usable fissile materials. Although highly enriched uranium would be an interim product, it would be down-blended to low-enriched uranium during electrometallurgical treatment. Within the current equipment configuration and design, it is not possible to produce weapons-usable plutonium by adjusting operating parameters. Traditional aqueous processing would have to be used after electrometallurgical treatment (pyroprocessing). However, traditional aqueous processing could also be used to produce weapons-usable plutonium directly from the spent nuclear fuel, without pyroprocessing. The United States' policy on nonproliferation is contained in Presidential Decision Directive 13, a classified document. At the time the Presidential Directive was signed, an unclassified press release stated that, "The U.S. will seek to eliminate where possible the accumulation of stockpiles of highly-enriched uranium or plutonium." This would be done by down-blending the highly enriched uranium in the driver spent nuclear fuel and immobilizing the plutonium in the ceramic waste form. The press release also stated that the United States "does not itself engage in plutonium reprocessing for either nuclear power or nuclear explosive purposes."
600-6	[*in reference to the Nuclear Waste Policy Act*]: "That Act can be amended. Congress spent all of an hour on that before they went off on their vacation for Christmas. That's one of the most bogus acts that's ever come across the radar screen in this country."	The actions of elected officials are beyond the scope of this EIS.

Comments from the Boise, ID, Public Hearing *August 24, 1999*		
No.	*Comments*	*DOE Responses*
600-7	"...even though the Department is supposedly committed to building a repository, it's still very possible that a repository will not be open in the near future. I mean, at the earliest possible date, it would be open to accept spent fuel would be what—2010, 2012, something like that. That's 10 years away. And yet, there's lots of other spent fuel that could go directly to the repository where the Waste Acceptance Criteria are currently from INEEL. So, it's not like you're looking at the earliest possible date 10 years away that anything needs to be done with the spent fuel, especially when it's continually reasserted that it poses no significant environmental problem right now. You're only talking about a problem as it exists in a repository."	In accordance with the Nuclear Waste Policy Act of 1982, DOE is committed to the development of a licensed national repository for spent nuclear fuel and high-level radioactive waste and is engaged in activities to fulfill this commitment. As stated in the introduction to the EIS, the programmatic risk in implementing any of the potential alternatives for the treatment and management of sodium-bonded spent nuclear fuel, or of not treating this fuel, is the uncertainty surrounding the acceptability of DOE spent nuclear fuel for emplacement in a potential geologic repository. Although not final, the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999 (see Section 4.12.1 of the EIS), indicates that it is highly probable that sodium-bonded spent nuclear fuel would not be acceptable in the repository without some stabilization and/or removal of the metallic sodium. The stabilization of the spent nuclear fuel and/or removal of the metallic sodium will provide greater protection of human health and the environment. Having completed the Electrometallurgical Treatment Research and Demonstration Project (see Section 1.6.3) and in planning the closure of its PUREX processing capabilities, DOE now needs to decide whether these processes are suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in the loss of capability and of experienced, knowledgeable technical staff should DOE decide at a later date to use the electrometallurgical process to treat sodium-bonded spent nuclear fuel. Section 1.2 of the EIS has been revised for clarification.
600-8	"...[Electrometallurgical treatment] treatment [of the sodium-bonded spent nuclear fuel] ... may not be required. That's my main point. You don't know that it's going to be required."	The focus of this EIS is to assess the potential environmental and health impacts associated with the treatment and management of sodium-bonded spent nuclear fuel. See response to comment 600-7.
600-9	"...without that [NAS National Research Council Waste Characterization] report, it's hard for the public to know what's going to happen with all these different waste streams."	The expected fate of each waste stream is identified in the EIS. The National Academy of Sciences' National Research Council Committee assessment of waste form development and characterization is available in the DOE public reading rooms.

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No.	*Comments*	*DOE Responses*
600-10	"Because you're basically, without treatment, the spent fuel, you have got one form of waste even though it's not technically referred to as waste now by the Department of Energy. You do the processing and you have got various waste streams that have not been characterized yet. How is the public to react to that in terms of what we're going to do with this and that waste stream if they're not defined? If they're not defined, they don't have a destination."	All of the alternatives evaluated in this EIS would produce some forms of high-level radioactive waste. Electrometallurgical treatment (pyroprocessing) would produce two new waste forms, both of which are more stable than untreated sodium-bonded spent nuclear fuel. DOE expects that these waste forms would be suitable for disposal in a geologic repository.
600-11	"You don't seem to take [the National Research Council's report on DOE's claims concerning the Electrometallurgical treatment demonstration project] too seriously, but the public does, because I don't think the public has a whole lot of trust in Argonne, sorry to say. But the U.S. Nuclear Regulatory Commission is an independent body, and I'm not saying they have instantly more credibility. But that's important, that verification or nonverification, and we don't have that yet."	DOE commissioned the National Academy of Sciences' National Research Council review of the electrometallurgical treatment technology in 1995. Early Committee reports were instrumental in the DOE's redirection of the Argonne program to concentrate on demonstrating the technology for sodium-bonded metal fuel. DOE will consider the final National Research Council report in making a decision on how to proceed with the treatment and management of the sodium-bonded spent nuclear fuel.
600-12	"The other thing [is] we can't use [the Nuclear Regulatory Commission report on the Electrometallurgical treatment demonstration project] to comment until the final EIS is out and [it] doesn't do much to hear the comment at that point, because you basically take what the preferred alternative is in the final EIS, and that's your Record of Decision. So it's a formality at that point."	While the final National Research Council report on the Electrometallurgical Treatment Research and Demonstration Project was published in April 2000, the Council's interim status reports on the project were made available in the public reading rooms. Thus, prior to making comments on the draft EIS, the public had an opportunity to review all of the information that was made available by the National Research Council and was used to prepare the EIS. DOE will consider the data contained in the final National Research Council report in preparing the Record of Decision.

Comments from the Boise, ID, Public Hearing *August 24, 1999*		
No.	*Comments*	*DOE Responses*
600-13	"...to refer to this technology as not reprocessing is so dishonest, so disingenuous. This is absolutely a reprocessing technology. ...Hazel O'Leary actually said in 1994 that this technology is the essential processing technology for IFR. And I know that you're saying that it's been amended but, in essence, this technology was designed to separate out plutonium. And that plutonium, based upon our nonproliferation stance, ran contrary to our nonproliferation stance, so we essentially killed IFR on those grounds. And here we have the most proliferable dangerous aspect of IFR still alive. And that runs very contrary to what we were given in the early '90s, which we were taking some responsible steps to set an example for the rest of the world not to reprocess. It doesn't mean that there aren't countries that are reprocessing. But our intent was to discourage other countries from reprocessing, to take that step in order to acquire bomb grade material. And here, you have a reprocessing technology that's being used. I know this material, for instance, the highly-enriched uranium is not going to be used for bombs, but it is bomb material; therefore, it's a reprocessing technology. And you're keeping alive a reprocessing technology that's, from my point, more dangerous than PUREX, because it can be more easily concealed. You can put this technology underground, where PUREX would be very difficult to do. Quote from a previous NAS study, because there have been many, quote: 'Probably the greatest hazard arises from spreading sophisticated technologies around the world, technologies which make reprocessing spent fuel easier and possible in facilities small enough to conceal underground.' That's directly from the NAS related to this technology. To quote professor James Warf from the University of Southern California, Professor of Chemistry, Emeritus, 'with some modifications plutonium could be produced.' To quote an Argonne spokesperson at the site in 1995, 'We could easily modify the technology to produce plutonium.' Another NAS conclusion, quote: 'could be redirected to produce material with nuclear detonation capability.' That report also raised questions about the interim storage of the waste streams and other aspects of pyroprocessing.	As stated in the Nonproliferation Impacts Assessment, the alternatives involving PUREX reprocessing and broad application of electrometallurgical treatment of both driver and blanket fuel have a greater potential to provide encouragement to other countries to engage in plutonium reprocessing. Given the small quantity and unique characteristics of the sodium-bonded spent nuclear fuel and the reason for the treatment, however, such encouragement, if any, would be limited. In addition, electrometallurgical treatment (pyroprocessing) would not result in an increase in weapons-usable fissile material inventories. Although highly enriched uranium would be an interim product, it is would be down-blended to low-enriched uranium during electrometallurgical treatment. As stated in response to comment 600-5, within the current equipment configuration and design, it is not possible to produce weapons-usable plutonium by adjusting operating parameters. Traditional aqueous processing would have to be used after electrometallurgical treatment. However, traditional aqueous processing could also be used to produce weapons-usable plutonium directly from the spent nuclear fuel, without electrometallurgical treatment. The commentor also makes reference to the Integral Fast Reactor program. The purpose for the Integral Fast Reactor program was to develop an efficient, safe process for recycling nuclear fuel by using a liquid metal-cooled reactor in combination with an integral fuel reprocessing facility. As part of this program, the EBR-II was used for fuel-design and fuel irradiation testing. Congress canceled funding for the Integral Fast Reactor program in 1994.

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No.	*Comments*	*DOE Responses*
600-14	"It [the question of whether Electrometallurgical treatment should or should not be considered reprocessing and, therefore, proliferation-prone] kind of raises the question of exactly why you're proceeding with this technology at this point, which I have asked several times tonight, and I definitely have not gotten a reasonable response."	Although not final, the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999 (see Section 4.12.1 of the EIS), indicates that it is highly probable that sodium-bonded spent nuclear fuel would not be acceptable in the repository without some stabilization and/or removal of the metallic sodium. The stabilization of the spent nuclear fuel and/or removal of the metallic sodium will provide greater protection of human health and the environment. Having completed the Electrometallurgical Treatment Research and Demonstration Project (see Section 1.6.3) and in planning the closure of its PUREX processing capabilities, DOE needs to decide whether this process is suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in the loss of capability and of experienced, knowledgeable technical staff involved with the demonstration project should DOE decide at a later date to use the electrometallurgical process to treat sodium-bonded spent nuclear fuel. Section 1.2 of the EIS has been revised for clarification. DOE also conducted four independent nonproliferation assessments of the electrometallurgical treatment technology over the last 11 years. These assessments found the electrometallurgical treatment technology to be in accordance with U.S. nuclear nonproliferation policy for this specific application, and concluded that electrometallurgical treatment is not capable of separating plutonium in a form that would be suitable for weapons production.
600-15	"A DOE source was quoted in a trade journal...saying, quote: 'Just about the only thing they have left to do,' meaning Argonne, 'is this procedure.' And quote: 'it's a jobs issue.' That's what the DOE source said directly about this procedure. It's corporate welfare. This project has been featured twice on *The Fleecing of America*. I don't know of any other thing that's ever been featured twice. That's very significant. That never happens."	Congress determines how funds are allocated. DOE spends monies consistent with Congressional direction. DOE is not in a position to make the difficult tradeoffs that may be required between alternative Federal programs and spending priorities. The issue of funding for the treatment and management of sodium-bonded spent nuclear fuel is beyond the scope of the SBSNF EIS.
600-16	"From what I understand, too, the reactor has not even been completely drained of the spent fuel, which the money that's been going all along, $20 million a year since 1994, part of that was supposed to have gone towards draining the reactor. And from what I understand, that's not even done at this point."	The commentor's reference to the draining of sodium from the EBR-II reactor is not related to the subject matter of this EIS, which is the treatment and management of sodium-bonded spent nuclear fuel. The sodium-bonded spent nuclear fuel that is the subject of this EIS was removed from the EBR-II reactor and is currently stored at the Radioactive Scrap and Waste Facility at ANL-W.

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No.	*Comments*	*DOE Responses*
600-17	"Another NAS quote: 'Although developers of the electrometallurgical technique argue that the technology is proliferation-resistant, any spent fuel processing approach that's capable of separating fissionable materials from associated fission products and transuranic elements could be redirected to produce material with nuclear detonation capability. Demonstration of the process could, however, add to the risk that a nation intent on weapons production might consider adapting this technology for possible production of fissile material, although such material would be of poor quality for a weapon.' And that's disputable."	The Nonproliferation Impacts Assessment is not part of the scope of the EIS. Electrometallurgical treatment technology is not capable of separating weapons-usable plutonium. Traditional aqueous processing would have to be used after electrometallurgical treatment to produce weapons-usable material. However, traditional aqueous processing could also be used to produce weapons-usable plutonium directly from the spent nuclear fuel.
600-18	"I guess you just want to give money to Argonne. If that's the issue, then I'd just as soon that you not pursue reprocessing as the technology that's used."	The commentor's opposition to electrometallurgical treatment (pyroprocessing) is noted. The issue of spending money for electrometallurgical treatment is beyond the scope of the EIS.
600-19	"At this point, I have to support the No Action alternative, because it's the most reasonable alternative. There's no facility to accept waste. The Waste Acceptance Criteria are not finally known. The waste doesn't present any environmental threat due to the presence of sodium at this point. Obviously, spent fuel is dangerous. That spent fuel without sodium is still dangerous. So there's no clear justification for going forth with this technology at this point. So I support the No Action alternative."	The commentor's support for the No Action Alternative is noted. The EIS discusses the status of the waste acceptance criteria in Section 2.7 and the environmental impacts of the No Action Alternative in Section 4.2. The timing of DOE's decision on the treatment and management of sodium-bonded spent nuclear fuel in relation to the availability of a geologic repository is discussed in Section 4.12.2.

Comments from the Idaho Falls, Idaho, Public Hearing August 26, 1999		
No.	*Comments*	*DOE Responses*
Anonymous		
700-1	"We haven't appropriated the money for the [SRS melt and dilute] facility, and our cost study is based on that facility being operational when we compare disposal method. That looks like, to me, it's flawed."	DOE assumes that the SRS melt and dilute facility will be available to process blanket spent nuclear fuel in 2022. Many of the costs associated with this alternative, such as those for preparing and packaging the fuel for shipment to SRS, occur at ANL-W. Congress appropriates funds for the treatment of spent nuclear fuel. DOE spends monies consistent with Congressional direction. The issue of funding for the treatment and management of sodium-bonded spent nuclear fuel is beyond the scope of the SBSNF EIS. DOE believes that the Cost Study is adequate for the purpose intended. The results of the Cost Study will be among the factors considered during the decision-making process leading to the Record of Decision.
700-2	"The driver fuel, of course, is the one that's not usable in terms of the PUREX process because of the infiltrated sodium. So the candidates for taking care of the sodium there really lend themselves to...the electrometallurgical process. But that's only three metric tons.... But the big part of the project really is 57 metric tons of depleted uranium, in which plutonium is inbred. The sodium is removable from the surface of the uranium rods. And we [ANL-W/INEEL] have done that process mechanically and chemically a number of times to the tune of probably several thousand fuel rods. And they were, in fact, shipped to Atomic International, and then to Savannah River. The technology worked. It's very cheap. It's very gross. ...Where is it going to go? It's going to go someplace. It has to be removed if it's sodium. ...Why do we consider anything else, in terms of the blanket rods, because it has been done many, many times before at Argonne-West, and at Atomic International and at Savannah River?"	DOE agrees with the commentor that decladding and removal of sodium from blanket spent fuel have been performed many times in the past. Section 2.3.9 and Appendix C of the EIS describe the processes used in the past. As described in Section 2.5.3, DOE evaluated an alternative in which the cleaned (metallic sodium removed) blanket spent nuclear fuel would be packaged in high-integrity cans for storage and disposal in a geologic repository. In addition, DOE evaluated other alternatives where the cleaned blanket fuel would be treated further. The selection of various alternatives is a required step in performing an EIS that is in compliance with NEPA and Council of Environmental Quality regulations.
700-3	"Unless there's an incentive to reclaim or separate the plutonium from the depleted uranium rods, it makes absolutely no sense to me to do anything more than remove the cladding, remove the sodium, and store those rods, store those slugs, at Savannah River, or wherever they are in storage, much like spent fuel is stored. To... downgrade, or to whatever, just increases the proliferation problem."	The commentor's recommendation to remove sodium and place blanket spent nuclear fuel in cans is noted and is discussed in Section 2.5.3.

Comments from the Idaho Falls, Idaho, Public Hearing *August 26, 1999*		
No.	*Comments*	*DOE Responses*
John Commander		
701-1	"We support the treatment of the sodium-bonded spent nuclear fuel by the electrometallurgical process. The process should be used for all the fuel as described in Alternative 1 of the Draft Environmental Impact Statement. The electrometallurgical treatment has been proven to be satisfactory. Many of the other alternatives are in the concept or research stage. Nearly all of the sodium-bonded fuel is now at Argonne National Laboratory-West. It makes both common and economic sense to do the entire treatment there. ...Again, we support Alternative 1 very strongly."	The commentor's support for the electrometallurgical treatment of both driver and blanket sodium-bonded spent nuclear fuel (Alternative 1) is noted.
701-2	"I'm also concerned about the loss of jobs and skills if the treatment is not done at Argonne National Laboratory-West. These skills are particularly important at this time. The current administration is finally putting some new funding into the research—nuclear research and technology. And DOE has designated the INEL [*sic*] as a lead laboratory for this effort. We want to keep these qualified people here."	The commentor's concern that jobs and skills will be lost if treatment of sodium-bonded spent nuclear fuel is not conducted at ANL-W is noted. DOE recognizes the value and the presence of important skills at ANL-W and INEEL. As part of the decision-making process, DOE will consider the consequences of potential impacts to various environmental resources, including socioeconomics. The Record of Decision will explain the rationale and factors for DOE's decision.
701-3	"The electrometallurgical treatment has little risk that nuclear material could be diverted to use in nuclear bombs. The Draft-EIS has adequately answered the comments of those concerned about that risk."	The commentor is correct. Electrometallurgical treatment of sodium-bonded spent nuclear fuel would not produce weapons-usable material, thereby reducing the risk that this spent nuclear fuel might be diverted for other uses.
701-4	"Whatever alternative is chosen, it must meet the terms of the 1995 Governor's Agreement on Nuclear Waste. If treatment is done at the Savannah River [site], material must be moved there before the year 2035. And it is not clear to me that those facilities will be available to do any treatment before that year. This date is the deadline for all spent fuel to be out of Idaho."	Section 4.12.2 of the EIS presents a discussion on schedule consideration for the treatment and management of sodium-bonded spent nuclear fuel for each of the alternatives considered in the EIS. According to these schedules, the treatment of sodium-bonded spent nuclear fuel could be completed by 2035 for all treatment alternatives, including the direct disposal option of the No Action Alternative. Under the continued storage option of the No Action Alternative, the sodium-bonded spent nuclear fuel would be transferred out of the State of Idaho before the 2035 deadline. The availability of the SRS facilities for treatment of blanket spent nuclear fuel is also discussed in Section 4.12.2.

Comments from the Idaho Falls, Idaho, Public Hearing *August 26, 1999*		
No.	*Comments*	*DOE Responses*
Dick Kenney		
702-1	"I think that your calculation of background radiation of 360 millirems per year is considerably less than what the residents of Idaho Falls receive. I think you've left out several elements...in that calculation."	As shown in Table 3–8 of the EIS, the approximately 360 millirem per year natural background radiation dose is the sum of the calculated effective dose equivalent from terrestrial and cosmic sources (external dose) specific to the Snake River Plain area, as well as the estimated doses from cosmogenic sources and radon gas (internal dose) provided in the National Council on Radiation Protection and Measurements Report No. 93, which lists the average dose to an American. An individual in the Idaho Falls area may or may not receive this dose because of variations between geographic areas. The EIS provides a summary of various contributing sources of radiation in the vicinity of the INEEL site.
702-2	"Coalition 21 strongly supports the treatment of sodium-bonded spent fuel by the electrometallurgical process. The process should be used for both the driver and the blanket fuel, as described in Alternative No. 1. The ANL-West is...has successfully demonstrated that the electrometallurgical treatment works. We see no reason for additional research in other technologies. Let's do it, get the job done and be done with it."	The commentor's support for using the electrometallurgical treatment process to treat driver and blanket sodium-bonded spent nuclear fuel (Alternative 1) is noted.
702-3	"This alternative [Alternative 1], properly done, will make the remnants of the IFR program ready for final disposal. It will be done in a timely manner by a technology that is compatible with the IFR concept, we do not want sodium-bonded fuel still in storage. We do not want that fuel to be used as an example of another failed technology. This position is consistent with the objectives of our lawsuit against the Department of Energy regarding the IFR."	The commentor's support for Alternative 1, the electrometallurgical treatment of sodium-bonded spent nuclear fuel at ANL-W, is noted. The commentor makes reference to the Integral Fast Reactor program. The purpose for the Integral Fast Reactor program was to develop an efficient, safe process for recycling nuclear fuel by using a liquid metal-cooled reactor in combination with an integral fuel reprocessing facility. As part of this program, the EBR-II was used for fuel-design and fuel irradiation testing. Congress canceled funding for the Integral Fast Reactor program in 1994. The commentor's concern that the sodium-bonded spent nuclear fuel could be used as an example of "another failed technology" and whether DOE decides to retrieve or revive the Integral Fast Reactor concept is beyond the scope of this EIS. In the lawsuit referred to by the commentor ("Coalition 21 v. U.S. Department of Energy and Tammy L. Hobbes," Civil Case No. CV 98-0299-B-BLW), Coalition 21 seeks to require DOE to prepare an EIS to address the shutdown of the EBR-II and claims that DOE failed to examine the potential environmental consequences of this action. Since deactivation of EBR-II does not involve the treatment and management of sodium-bonded spent nuclear fuel, the objectives referred to by the commentor are beyond the scope of this EIS.

Comments from the Idaho Falls, Idaho, Public Hearing *August 26, 1999*		
No.	*Comments*	*DOE Responses*
702-4	DOE does not plan to generate more sodium-bonded fuel; thus, it is a limited program, one that can be solved and should be solved sooner, rather than later."	The commentor's support for the proposed action, the treatment and management of sodium-bonded spent nuclear fuel, is noted. As the commentor noted, with the shutdown and removal of all fuel from the EBR-II, DOE can no longer generate any additional sodium-bonded spent nuclear fuel at INEEL. Ninety-eight percent of the DOE-owned sodium-bonded fuel is now at the ANL-West and INTEC. Having completed the Electrometallurgical Treatment Research and Demonstration Project (see Section 1.6.3) and in planning the closure of its PUREX processing capabilities, DOE now needs to decide whether these processes are suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in the loss of capability and of experienced, knowledgeable technical staff should DOE decide at a later date to use the electrometallurgical process to treat sodium-bonded spent nuclear fuel. Section 1.2 of the EIS has been revised for clarification.
Ted Carpenter		
703-1	"The tribes are renowned for use of resources efficiently and maximally. I support the electrometallurgical process because it does produce a separated uranium metal product. Once the earth has been invaded and the crust has been broken up to remove the rocks and the metal's been refined, let's keep using it, instead of considering it waste. The same thing goes for the fact that it separates out the stainless steel and noble metals—zirconium, niobium, nickel, chromium—all of those things. Those are resources; they are not waste."	Most of the noble metal fission products (e.g., niobium, technetium, ruthenium, rubidium, silver, cadmium, and zirconium) and fuel alloy (zirconium) in the electrorefiners would remain with the fuel cladding hull in the anode basket. In addition, some actinides would also remain with the noble fission products. The amount of material retained in the anode basket would strictly depend on the electrorefining operation conditions. If more actinides and the fuel matrix were dissolved in the molten salts, the retention of noble fission products would be lowered. The metal remains in the anode basket would be radioactive, and would be classified as high-level radioactive waste. It is true that electrometallurgical treatment has been used to produce metals from impure feedstock. However, that impure feedstock included metals with chemical contamination, not radioactive isotopes of the same metals. Noble metal recovery from the metallic waste would have limited uses because the metal would still be radioactive, (i.e., it would contain radioactive isotopes of the metal elements) and would still be considered radioactive metallic waste. However, uranium would be separated and could be used for other purposes. The disposition of this uranium, along with DOE's inventory of surplus uranium, will be determined through another NEPA review.

Comments from the Idaho Falls, Idaho, Public Hearing *August 26, 1999*		
No.	*Comments*	*DOE Responses*
703-2	"Also, of course, the fact that this Alternative 1 has minimal transportation across reservations simply avoids the issues of some of...the members who have fears."	As explained in the EIS, the risks associated with the fuel transport are very small. Regardless of the alternative, DOE would need to transport spent nuclear fuel and/or high-level waste out of the INEEL site. DOE will proceed in accordance with the DOE/Shoshone-Bannock Tribes Agreement-in-Principal, which covers notification and coordination of the transport of radioactive materials across the Fort Hall Reservation. Risks, including transportation, have been addressed in the EIS and will be considered by DOE prior to making any decisions regarding the treatment and management of sodium-bonded spent nuclear fuel.
Steve Herring		
704-1	"The options for the driver are really driven by the amount of sodium that is contained in the pores within the fuel. And, consequently, the electrometallurgic process is about the only viable alternative for getting that sodium out. For the blanket, it seems to me that we have a viable choice based on how well we can characterize the long-term longevity of those high-integrity cans. I understand that specifications can be written for them. But, if we write those specifications, that they have to be shown to be integral for 10,000 years, then we have a major testing program ahead of us for that. ...therefore,...if that is a driver on the cost of the options, then the electrometallurgical process should be used for the blanket, as well. However, if that is not a driver on the cost, then the use of high-integrity cans for the blanket assembly should be used for both of those, both Options 1 and 2, minimizing the amount of transportation.... And so, therefore, I would like to speak in favor of either Options 1 or 2."	The commentor's support for the use of the electrometallurgical process to treat driver sodium-bonded spent nuclear fuel is noted. The EIS does not present a cost comparison of the alternatives. However, a separate DOE Cost Study does compare the costs of each alternative. This Cost Study assumes that isolation of the treated spent nuclear fuel in a 10,000-year repository would rely on the integrity of other containment barriers rather than high-integrity can packaging.

Comments from the Idaho Falls, Idaho, Public Hearing *August 26, 1999*		
No.	*Comments*	*DOE Responses*
John Tanner		
705-1	"The treatment of the driver portion of the sodium-bonded nuclear fuel by the electrometallurgical process is the most sensible option proposed for the following reasons: It would allow recovery and use of the high-enriched uranium, which is valuable material that was costly to produce. This [driver] fuel is not suitable for the PUREX process, as already explained in the DEIS. The other methods, melt and dilute, chloride volatility, plasma arc ceramic, and so forth, are less well developed, are likely to be more expensive even after development, and involve heating the fuel to high temperatures, which will worry some people about whether the volatile elements would pollute the air."	The commentor's support for the treatment of driver sodium-bonded spent nuclear fuel by the electrometallurgical treatment method is noted. The EIS discusses all of the commentor's areas of concern. Separate studies consider the nonproliferation characteristics of the various alternative technologies and the costs associated with each of the alternatives. The EIS assessment and the conclusions presented in the separate studies will be considered during DOE's decision-making process, the results of which will be published in the Record of Decision.
705-2	"The plutonium in the blanket fuel is also valuable and should be recovered. If this [plutonium recovery from the blanket fuel] were done by the PUREX process, the recovered plutonium would be pure enough to be made into mixed oxide fuel to generate electricity in commercial power reactors. Much of the development of this [PUREX] process is already contemplated for plutonium recovered from weapons. The cost of decladding, sodium removal, and shipment from Idaho would, of course, need to be considered. The plutonium could also be recovered by the electrometallurgical process. Why is this not mentioned as an alternative in the DEIS? This is as reasonable as many of the other alternatives presented. Although the recovered plutonium would be too contaminated with other transuranic elements to be useful as MOX fuel, it would be useful in a future fast neutron reactor, such as the one which produced it.	The commentor's remarks about the value of plutonium present in the sodium-bonded spent nuclear fuel are noted. The intent of this EIS, as discussed in Section 1.2, is to resolve issues associated with the sodium content of sodium-bonded spent nuclear fuel. The disposition of the fissile material content of the fuel is not within the scope of the EIS and is not considered an issue in the formulation of the reasonable alternatives. It is, however, an important consideration in the Nonproliferation Impacts Assessment of the alternatives that was prepared separately from the EIS. The conclusions of the Nonproliferation Impacts Assessment, along with those of the EIS, will be considered during the decision-making process leading to the Record of Decision.

Comments from the Idaho Falls, Idaho, Public Hearing *August 26, 1999*		
No.	*Comments*	*DOE Responses*
705-3	"But to answer the question just raised, recovery of plutonium by the electrometallurgical process was omitted in order to please influential antinuclear critics who raised weapons proliferation concerns, ignoring the fact that the electrometallurgical process is far more proliferation- resistant than the well-known PUREX process. The demonstration of plutonium separation by the electrometallurgical process would do nothing to aid anyone's ability to obtain weapons-usable material." "However, putting this plutonium in the waste, as proposed for most of the alternatives in the DEIS, will only temporarily please these critics. When it is later proposed to bury this waste, whether in Yucca Mountain or elsewhere, they will again object, pointing to plutonium's long half-life and to recent evidence that trace amounts of plutonium can migrate in groundwater under special artificial conditions. Note that the critics have been vehemently opposing the transport and burial of waste with only trace amounts of plutonium in the WIPP. What will they say when it is proposed to bury waste with substantial amounts of plutonium?"	DOE, consistent with U.S. nuclear nonproliferation policy, would not separate plutonium except for the PUREX process. DOE expects that the plutonium-containing waste from the electrometallurgical treatment process would be acceptable in a geologic repository for the same reasons that plutonium-containing commercial spent nuclear fuel is already acceptable.
705-4	Any method of dealing with plutonium will be criticized. Therefore, we should do the sensible thing and recover it for later use."	The commentor's remarks about the value of plutonium present in the sodium-bonded spent nuclear fuel are noted. The intent of this EIS, as discussed in Section 1.2, is to resolve issues associated with the sodium content of sodium-bonded spent nuclear fuel. The disposition of the fissile material content of the fuel is not within the scope of the EIS and is not considered an issue in the formulation of the reasonable alternatives. It is, however, an important consideration in the Nonproliferation Impacts Assessment of the alternatives that DOE prepared separately from this EIS. The conclusions of the Nonproliferation Impacts Assessment and those of the EIS will be considered during the decision-making process.
Beatrice Brailsford		
706-1	"I think you have done a good job in the draft EIS, demonstrating that nothing needs to be done with the blanket fuel, as far as for the processing beyond the removal of the sodium in mechanical ways in which we know how to do...certainly for the blanket, no action is the appropriate course."	The commentor's opinion that the appropriate course for blanket sodium-bonded spent nuclear fuel is sodium removal and direct disposal (Alternative 2 for blanket fuel), is noted.

Comments from the Idaho Falls, Idaho, Public Hearing *August 26, 1999*		
No.	*Comments*	*DOE Responses*
706-2	"As you know, we have asked for an extension of this comment period. ...And it seems to me that...you really are looking at a real rush job to try to finish this up by the end of the year. So, I would encourage you to extend the comment period on the draft EIS..."	In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169). DOE did not rush the preparation of the EIS. By extending the comment period, it provided the public with additional time to consider and make comments on the document.
706-3	"[Extend the comment period] ...at least until the NRC [National Research Council] analysis comes out. I received the cost study and the nonproliferation report today. And I won't receive the NRC report until December, simply because you won't either."	While the final National Research Council report on the Electrometallurgical Treatment Research and Demonstration Project was published in April 2000, the Council's interim status reports on the project were made available in the public reading rooms. Thus, prior to making comments on the draft EIS, the public had an opportunity to review all of the information that was made available by the National Research Council and was used to prepare the EIS. DOE will consider the data contained in the final National Research Council report in preparing the Record of Decision.

Comments from the Arlington, Virginia, Public Hearing August 31, 1999		
No.	*Comments*	*DOE Responses*
Maureen Eldredge		
800-1	"I take offense at talking about nuclear processes and telling the public that it's like common table salt—that you can go buy it in the grocery store. It's just an aside that I urge you not to use that kind of language."	The commentor is referring to an analogy used in the DOE presentation on August 31, 1999, to explain the disposition of metallic sodium in the sodium-bonded spent nuclear fuel during electrometallurgical treatment. As stated in the EIS, during electrometallurgical treatment the metallic sodium would be converted into a nonreactive form (sodium chloride) and would be disposed of with the high-level ceramic radioactive waste product. In the DOE presentation, the nonreactive sodium chloride form was described as analogous to "common table salt." It was not DOE's intent to mislead the public to believe that they could buy this "salt" in a grocery store; rather, DOE sought to communicate to the public what happens to the metallic sodium during treatment.
800-2	"...you mentioned the need to make a decision regarding PUREX because the [SRS] canyons will be shutting down. Do you have a schedule for that shutdown? I was not aware there was an actual date certain."	The plans for shutdown are being developed. Therefore, if PUREX processing were selected, sodium-bonded blanket fuel would need to be placed on the schedule.

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No.	*Comments*	*DOE Responses*
800-3	"This project and the need for it in terms of the repository is completely incompatible with the schedule that Yucca Mountain is on. Not only are the waste criteria not set, there are growing concerns about the feasibility of that site as a repository and at least five years out, if not longer, before those kinds of decisions would be made." "I think probably you could add to a list of 'why now', the Federal Budget process with the Fiscal year 2000 starting on October 1st and the problem this project ran into in that they wouldn't be able to justify spending money if suddenly they weren't going to have a ROD into the middle of the fiscal year. Perhaps I'm just being cynical."	In accordance with the Nuclear Waste Policy Act of 1982, DOE is committed to the development of a licensed national repository for spent nuclear fuel and high-level radioactive waste and is engaged in activities to fulfill this commitment. This commitment is ongoing. The EIS does not assume that Yucca Mountain will be selected as the high-level waste repository. It only assumes that, at some time in the future, a geologic waste repository will be licensed and operated by DOE which will receive spent nuclear fuel and high-level radioactive waste. As stated in the introduction to the EIS, the programmatic risk in implementing any of the potential alternatives for the treatment and management of sodium-bonded spent nuclear fuel, or of not treating this fuel, is the uncertainty surrounding the acceptability of DOE spent nuclear fuel for emplacement in a potential geologic repository. Although not final, the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999 (see Section 4.12.1 of the EIS), indicates that it is highly probable that sodium-bonded spent nuclear fuel would not be acceptable in the repository without some stabilization and/or removal of the metallic sodium. The stabilization of the spent nuclear fuel and/or removal of the metallic sodium will provide greater protection of human health and the environment. Having completed the Electrometallurgical Treatment Research and Demonstration Project (see Section 1.6.3) and in planning the closure of its PUREX processing capabilities, DOE needs to decide whether these processes are suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in the loss of capability and of experienced, knowledgeable technical staff should DOE decide at a later date to use the electrometallurgical process to treat sodium-bonded spent nuclear fuel. Section 1.2 of the EIS has been revised for clarification.
800-4	"I believe that the whole point of looking at cumulative impacts was that you might have a series of nonsignificant impacts which, when added up would become an impact. So I urge you to look at that again."	As described in Section 4.11 of the EIS, cumulative impacts are defined by the Council on Environmental Quality as the environmental impacts that result from the incremental impact of the action when added to other, past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or nonfederal) or person undertakes such other actions. This section provides the discussion on the cumulative impacts for all resources evaluated in the EIS. For each resource, where the incremental impact from an action would be very small, its contribution to the cumulative impacts would be insignificant.

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No.	*Comments*	*DOE Responses*
800-5	"Once again, as always, we do not believe there is a need for this action. It's our continued belief that this project is not proceeding because of any need, but rather the political need to retain jobs at Argonne West, retain missions, and leave the door open for their future dream of getting more waste forms to process. That hope has been revitalized in many ways, including Senator Domenici's attempts to start a new Office of Reprocessing. So I think it's a realistic hope on their part and one of the reasons we are continuing to oppose this project."	DOE is responsible for developing and maintaining a capability to safely manage its spent nuclear fuel. To ensure that the State of Idaho Settlement Agreement and Consent Order is met, and to facilitate disposal, DOE needs to reduce the uncertainties associated with qualifying the sodium-bonded spent nuclear fuel for disposal. While DOE notes the commentor's belief that the need for the proposed action is concerned with the political need to retain jobs and missions at ANL-W and the hope of having more waste forms to process, this comment is beyond the scope of this EIS. See response to comment 800-3.
Hisham Zerriffi		
801-1	"...the major purpose of this action is to remove the reactive sodium, toxic-sodium from the spent fuel. Now, for most of the alternatives...or some of the alternatives at least, for the blanket spent fuel you are going to do that removal process at Argonne using the process described in Section 2.4.9, which is a fairly simple process, it seems. And then run it through PUREX? What's the point of the second part of that, exactly, if you've already removed the sodium in the Argonne hot cell?"	The programmatic risk in implementing any of the potential alternatives for the treatment and management of sodium-bonded spent nuclear fuel, or of not treating this fuel, is the uncertainty surrounding the acceptability of DOE's spent nuclear fuel for emplacement in a potential geologic repository. While DOE has drafted preliminary waste acceptance criteria for a geologic repository, the final acceptance criteria will be more refined. If the repository is developed, final acceptance criteria will not be available until after the U.S. Nuclear Regulatory Commission issues its construction authorization based on successful demonstration of the safe, long-term performance of the repository in accordance with the U.S. Nuclear Regulatory Commission regulations. The presence of metallic sodium is the primary but not the only reason for the proposed action. The presence of metallic uranium or highly enriched uranium, could also complicate the process of certifying the repository. Such certification would require sufficient data and predictive analyses to demonstrate that emplacement of the spent nuclear fuel would not adversely affect a repository's ability to protect the environment and worker and public health and safety. To ensure that requirements of the State of Idaho Settlement Agreement and Consent Order are met and to facilitate disposal, DOE needs to reduce the uncertainties associated with qualifying sodium-bonded spent nuclear fuel for disposal. Appropriate treatment and management of the sodium-bonded spent nuclear fuel (e.g., PUREX processing) would significantly reduce complications related to disposal qualifications. The borosilicate glass waste form resulting from PUREX processing has been extensively tested and analyzed under conditions relevant to a geologic repository. DOE expects that other waste forms (e.g., ceramic and metallic) would be suitable for repository disposal.

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No.	*Comments*	*DOE Responses*
801-2	"...I think the final EIS does need to clarify—yes, I understand that you have metallic uranium in the fuel and that is also an issue for the repository, as is the HEU. And I think that's not -- I mean, it's clear to me when I read through it but I think most of the public reading through it is not going to be very clear on that. That this is an issue of both sodium and the other metals and the HEU, and what of each of these are going to handle which part of that process? And I think that needs to be much more defined in the final EIS if you're going to do it."	Section 2.2 of the EIS states that the 60 metric tons of heavy metal of sodium-bonded spent nuclear fuel constitutes approximately 2 percent of DOE's total current spent nuclear fuel inventory of nearly 2,500 metric tons of heavy metal. According to the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999, DOE spent nuclear fuel "may be accepted as bare fuel. The specific acceptance criteria for this bare fuel will be developed on a case by case basis." The decision, therefore, whether or not to treat spent nuclear fuel, including the N-Reactor fuel, before placement in a geologic repository has not been made. As discussed in Section 1.2 of the EIS, the presence of metallic sodium is the primary but not the only reason for the proposed action. The presence of metallic uranium, or the presence of highly enriched uranium, could also complicate the process of certifying the geologic repository. Such certification would require sufficient data and predictive analyses to demonstrate that placement of the spent nuclear fuel would not adversely affect a repository's ability to protect the environment and worker and public health and safety. To ensure that the State of Idaho Settlement Agreement and Consent Order is met, and to facilitate disposal, DOE needs to reduce the uncertainties associated with qualifying sodium-bonded spent nuclear fuel for disposal. Appropriate treatment and management of the sodium-bonded spent nuclear fuel would significantly reduce complications related to disposal qualifications.

Comments from the Arlington, Virginia, Public Hearing August 31, 1999		
No.	*Comments*	*DOE Responses*
801-3	"The IEER [Institute for Energy and Environmental Research] is disappointed that the Department has again issued a draft EIS which seems to sacrifice some pretty important environmental and nonproliferation goals to meet some programmatic goals which are questionable."	DOE is responsible for developing and maintaining a capability to safely manage its spent nuclear fuel. As stated in the introduction to the EIS, this EIS follows the June 1995 Record of Decision (60 FR 28680) for the "Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Final Environmental Impact Statement," in which DOE decided to regionalize spent nuclear fuel management by fuel type for DOE-owned spent nuclear fuel. DOE also decided to: (1) continue environmental restoration activities at INEEL; (2) develop cost-effective treatment technologies for spent nuclear fuel and waste management; and (3) implement projects and facilities to prepare waste and treat spent nuclear fuel for interim storage and final disposition. The Record of Decision provides the programmatic umbrella for the site-specific actions addressed in this EIS, as well as the Savannah River Spent Nuclear Fuel Management EIS and the Idaho High-Level Waste and Facilities Disposition EIS. DOE is committed to improving its environmental management practices; to operating its facilities in a manner that meets or exceeds all applicable environmental, safety, and health requirements; and to cleaning up its environmental problems. The focus of this EIS is to assess the potential environmental and health impacts associated with the treatment and management of sodium-bonded spent nuclear fuel. Although not final, the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999 (see Section 4.12.1 of the EIS), indicates that it is highly probable that sodium-bonded spent nuclear fuel would not be acceptable in the repository without some stabilization and/or removal of the metallic sodium. Stabilization of the spent nuclear fuel and/or removal of the metallic sodium would provide greater protection of human health and the environment. Having completed the Electrometallurgical Treatment Research and Demonstration Project (see Section 1.6.3) and in planning the closure of its PUREX processing capabilities, DOE now needs to decide whether these processes are suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in a loss of capability and of experienced and knowledgeable technical staff should DOE decide at a later date to use the electrometallurgical process to treat sodium-bonded spent nuclear fuel. Section 1.2 of the EIS has been revised for clarification. DOE has also conducted an independent Nonproliferation Impacts Assessment of the treatment technologies analyzed in the this EIS. The Nonproliferation Impacts Assessment found all of the treatment technologies, except for PUREX processing at SRS, to be in accordance with U.S. nuclear nonproliferation policy.

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No.	*Comments*	*DOE Responses*
801-4	"...there are no immediate health, environmental, and safety risks that need to be addressed immediately or that cannot be addressed through some sort of simple minimal preparation and fuel storage. I believe that's basically what the draft EIS states."	The timing for this action is a programmatic issue rather than a safety issue. As stated in Section 1.2 of the EIS, DOE considers it prudent to evaluate the alternative technologies now while DOE is performing site characterization activities for the potential repository at Yucca Mountain. See response to comment 801-3.
801-5	"There's no guarantee that Yucca Mountain is going to be selected as the high-level waste repository, and there's considerable technical controversy still over suitability."	The SBSNF EIS does not assume that Yucca Mountain will be selected as the high-level waste repository. It only assumes that, at some time in the future, a geologic waste repository will be licensed and operated by DOE and will receive spent nuclear fuel and high-level radioactive waste.
801-6	"If Yucca Mountain is chosen, the final waste acceptance criteria have not yet been established and there's a programmatic risk, as the DEIS states, that the final waste forms won't meet whatever criteria are chosen."	See response to comment 801-3.
801-7	"The argument in the EIS that potential waste forms should be developed in parallel with the repository is inconsistent with the fact that processing will start in the year 2000. This is five years before the estimated time for receiving a construction permit from the NRC [U.S. Nuclear Regulatory Commission], which will be a necessary step in developing the final waste form. You're actually proposing to process this spent fuel, not develop potential waste forms, as it states in the purpose and need for action. And these are not parallel processes; these are sequential processes, with one coming very much before the other and in my opinion, the wrong order."	The siting and development of a repository, the finalization of the waste acceptance criteria, and the treatment and management of sodium-bonded spent nuclear fuel are not necessarily sequential actions, but are interdependent parts of a larger action outlined in the Record of Decision for the Programmatic Spent Nuclear Fuel EIS (60 FR 28680). The relationship between this EIS and these interdependent actions is discussed and addressed, where appropriate, in the EIS. As stated in Section 1.2 of the EIS, DOE considers it prudent to evaluate the alternative technologies now while it is performing site characterization activities for the potential repository at Yucca Mountain. Also, to ensure the State of Idaho Settlement Agreement and Consent Order is met, and to facilitate disposal, DOE needs to reduce the uncertainties associated with qualifying sodium-bonded spent nuclear fuel for disposal. Appropriate treatment and management of the sodium-bonded spent nuclear fuel would significantly reduce complications related to disposal qualifications. The borosilicate glass waste form resulting from PUREX processing has been extensively tested and analyzed under conditions relevant to a geologic repository. DOE expects that other forms (e.g., ceramic, metallic, and high-integrity cans that do not contain metallic sodium) would be suitable for repository disposal. The development of waste forms in parallel with the development of the repository is one of many considerations discussed under the purpose and need section of the EIS (see Section 1.2). The primary consideration is the removal or conversion of metallic sodium to a nonreactive form. See response to comment 801-3.

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No.	*Comments*	*DOE Responses*
801-8	"There also are no immediate time constraints posed by the State of Idaho settlements. As I said earlier, you know, spent fuel doesn't have to be removed until 2035. Even if you take a certain number of years to develop alternative processing, if so desired, and a certain number of years to process those, 2035 is a long ways off still."	See response to comment 801-3.
801-9	"I think it needs to be clear in the EIS that, of 60 metric tons of this spent fuel, as you stated earlier, 57 metric tons can have the sodium removed without any of these proposed processes. And also that these 57 metric tons also don't contain any HEU, which is another issue stated in the EIS as a purpose and need for action."	The EIS, under Alternative 2 (Section 2.5.3), analyzes the environmental impacts of removing sodium from 57 metric tons of blanket sodium-bonded spent nuclear fuel and the subsequent packaging of this fuel in high-integrity cans without any additional treatment and/or stabilization of the spent nuclear fuel. The environmental consequences of this action are presented in Section 4.4. As described in Appendix D, Section D.3.2.2, the uranium in the 57 metric tons of blanket fuel is depleted uranium and not highly-enriched uranium. Section 2.2 of the EIS was revised to be consistent with the information presented in Appendix D. If the finalized waste acceptance criteria for the repository requires the removal of sodium from the spent nuclear fuel, this requirement would apply to all 60 metric tons of sodium-bonded spent nuclear fuel addressed in this EIS. As described in Sections 2.2 and 2.3.9 of the EIS (formerly Section 2.4.9 of the draft EIS issued in July 1999), different treatment methods are required for the removal of sodium from driver fuel (3 metric tons) and blanket fuel (57 metric tons).

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No.	*Comments*	*DOE Responses*
801-10	"So really what we're talking about is three metric tons in terms of the sodium removal, and possibly another 57 metric tons in terms of the uranium issues. But that needs to be clear and needs to be stated under what criteria those would be an issue in terms of the repository."	As discussed in Section 1.2 of the EIS, the need for the proposed action is to ensure that the requirements of the State of Idaho Settlement Agreement and Consent Order are met and to facilitate disposal of the sodium-bonded spent nuclear fuel in a geologic repository. The need for this facilitation is the reduction of the programmatic risk associated with the presence of metallic sodium, the presence of metallic uranium or highly enriched uranium in the spent nuclear fuel, and the ongoing development of high-level radioactive waste acceptance criteria for repository disposal. The goal of each of the reasonable alternatives evaluated in the EIS is to reduce the programmatic risk in different ways. The commentor's assertion that the treatment of driver spent nuclear fuel is about sodium removal and the treatment of blanket spent nuclear fuel, beyond sodium removal, is about other issues discussed in the purpose and need section of the EIS is correct. For example, Alternative 2 in the EIS addresses only sodium removal. The other alternatives go beyond sodium removal. It should be noted that PUREX processing at SRS was included as a reasonable alternative in response to the National Research Council recommendation that only PUREX processing would provide a viable alternative to the electrometallurgical treatment technology. DOE believes that the EIS is clear on the issues related to the waste acceptance criteria for repository disposal.
801-11	"So not only have, you know, you not necessarily made the case, at least in our opinion, as to why you need to do this now and what the purpose is of this process...,"	See response to comment 801-3.

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No.	*Comments*	*DOE Responses*
801-12	"...there are a number of proliferation risks which have not been brought up yet in this meeting, which I'm a little disappointed. So let me discuss just really briefly this nonproliferation review that was put out. It does note a few of the important proliferation risks posed by EMT. And you know, it can produce weapons-usable HEU. It is a subset of a larger process which can separate plutonium and, therefore, it parallels with traditional reprocessing techniques. It does involve both processing, which makes international safeguards harder to implement, and safeguards have not been demonstrated on this technology. I'm not going to go into very much detail since there is nobody here from the Non-Proliferation Office. Let me state though, that review does underplay a lot of the risks of EMT in particular. And I focus on EMT simply because it is such a major portion of this EIS, despite the fact of the name change and the addition of other proposed actions. This started off as an EMT EIS. EMT is a major part of why these are alternatives." You know, the fact that DOE concludes in this review that EMT fully maintains consistency with U.S. nonproliferation policy is very puzzling to me considering its potential implications, both in the U.S. And globally. ...So as I say, I'm not going to go through a lot of these other nonproliferation comments, since they don't seem relevant here, but let me just note that, in terms of EMT, something that needs to be really taken into consideration is the fact that it is a process which is a subset of pyroprocessing, which could have the cadmium cathode and cathode processor put back in. You'd then end up with a substance—once you've removed that cadmium cathode and processed it—which is up to 70 percent plutonium. If a proliferator decided to then take that plutonium product—70 percent plutonium, about 30 percent uranium, less than one percent fission products, according to the OTA study from '94, and I imagine those numbers haven't changed all that much—an aqueous process to then separate out the plutonium from that would be a much different aqueous process than international safeguards are used to dealing with..." Much smaller scale of materials to be processed [*sic*]. You don't have the fission products to worry about. Yes, you have a bit of a higher radiation dose than separated plutonium, but a poor Asian country is not going to worry about that. So I think you've got to be clear as to what the implications of this are in that nonproliferation review. It kind of was a bit of a whitewash."	The assessment of nonproliferation impacts is not part of the scope of the EIS. However, none of the alternatives analyzed in this EIS, except PUREX processing at SRS, would generate weapons-usable fissile materials. Although highly enriched uranium would be an interim product, it would be down-blended to low-enriched uranium during electrometallurgical treatment. There are several features of the electrometallurgical treatment process that make it adaptable to international safeguards. The process cell, made inaccessible to humans by high radiation, inert atmosphere, and thick concrete walls, has a minimal number of penetrations through which materials can be moved in and out. These openings are secured and can be readily monitored for material transfers. There are no liquid waste streams through which materials can be piped out of the facility. All by-products and waste from the process would be in solid form, and so would be accountable by unit inventory. Finally, all by-products and waste moving out of the facility could be subjected to nondestructive examination if additional assurances were required under international safeguards agreements. As conceived for the canceled Integral Fast Reactor project, the liquid cadmium cathode would have produced a metal alloy product containing up to 70 percent plutonium which could only have been obtained after subsequent processing in a high-temperature vacuum furnace. The balance of materials would be those elements most difficult to separate from plutonium by any chemical means, such as uranium, americium, neptunium, curium, and the rare earth fission products. The plutonium metal-alloy product would have high fission product and transuranic content, a high heat source, a high neutron radiation source, and a high gamma radiation source, any one of which would make design of a weapon extremely difficult. Neutron and gamma radiation would be three to four orders of magnitude higher than weapons-grade or reactor-grade material. These levels of radiation are lethal and would prohibit any handling of the material or weapon by other than remote means. Development of the cathode progressed only to the point of technical feasibility. No prototype or working model was ever commissioned for the Fuel Conditioning Facility. Under the electrometallurgical treatment process, plutonium would stay mixed with the fission products and electrolyte salt. Plutonium and fission products would then be immobilized in the ceramic waste form. The ceramic waste form is more resistant to plutonium recovery than the metallic forms that result from other alternatives that use the melt and dilute process and high-integrity cans.

Comments from the Arlington, Virginia, Public Hearing *August 31, 1999*		
No.	*Comments*	*DOE Responses*
Edwin Lyman		
802-1	"I would like to commend the people in charge of this process for responding, I think, really in a surprising way to some of the comments that Nuclear Control Institute and others made during the scoping process. Restructuring the shape of the EIS so that at least the title didn't reflect—the emphasis on Electrometallurgical treatment was a pleasant surprise, as well as the acknowledgment more explicitly that the characteristics of the blanket and the driver were different; that the blanket which formed the bulk of the fuel could have the sodium removed much more simply than the driver fuel."	The comment is noted. DOE revised the scope of the EIS based on comments provided during the public scoping period.
802-2	"And even the acknowledgment that the option that involves mechanical decladding and sodium removal, the blanket, seems to be cheaper according to the Cost Study, which is another pleasant surprise, but something we might have anticipated."	Actual costs for treating and managing the sodium-bonded spent nuclear fuel are not part of the scope of the EIS. However, according to the August 1999 Cost Study, the least expensive alternative to No Action is Alternative 2, which includes blanket spent nuclear fuel sodium removal, but does not include mechanical decladding. Information such as costs, schedules, environmental consequences, and technical risk will factor into the Record of Decision for the treatment and management of sodium-bonded spent nuclear fuel.

Comments from the Arlington, Virginia, Public Hearing *August 31, 1999*		
No.	*Comments*	*DOE Responses*
802-3	"That said, I don't think that the draft EIS in its present form really addresses the key issue which has come up before and I'd like to reiterate it; the fact that if you're only looking now at three tons of fuel there has been no demonstration other than hand-waving referring to draft waste acceptance criteria, referring to RCRA; why this fuel cannot be directly disposed of in any repository being that it's such a small fraction of the overall inventory of radionuclides in the repository. ...I'm not advocating that corners be cut on safety, but I'd say we haven't seen a demonstration yet of why this small amount of sodium-bonded fuel would actually contribute in a significant way to the overall environmental consequences of the repository."	The uncertainties associated with qualifying sodium-bonded spent nuclear fuel for repository disposal are based on the existing regulatory environment. As discussed in Section 4.12.1 of the EIS, one of the key Nuclear Regulatory Commission requirements for acceptance of spent nuclear fuel or high-level radioactive waste is that it cannot contain or generate materials that are explosive, pyrophoric, or chemically reactive (in a repository environment) in a form or amount that could compromise the repository's ability to perform its waste isolation function or to satisfy its performance objective (10 CFR 60.135(b)(1)). In addition, in accordance with the April 1999 version of the DOE Office of Civilian Radioactive Waste Management's Waste Acceptance Systems Requirements Document, only spent nuclear fuel and high-level radioactive waste that is not subject to regulation under RCRA, Subtitle C, and meets all other acceptance criteria (e.g., packaging, uranium content), will be accepted for disposal. Although this determination for sodium-bonded spent nuclear fuel has not been made, it is a possible outcome. Based on the current regulatory environment, it is highly probable that sodium-bonded spent nuclear fuel will not be qualified for repository disposal without removal or conversion of the metallic sodium to a nonreactive form.

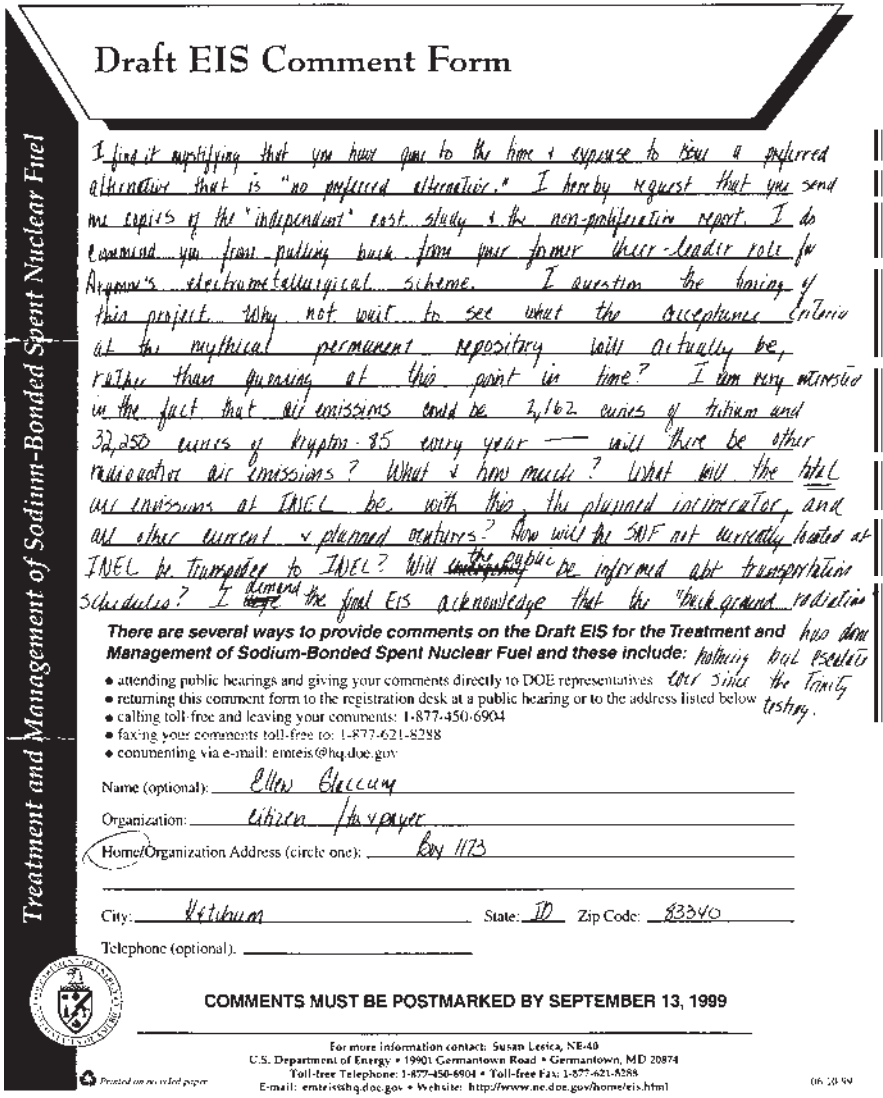
Comments from the Arlington, Virginia, Public Hearing *August 31, 1999*		
No.	*Comments*	*DOE Responses*
802-4	"And I'd just like to point out that DOE seems to embrace certain risk constraints when it sees fit and try to amend or seek waivers for others, and just comparing Yucca Mountain and WIPP makes it pretty clear.... I just read that DOE is now proposing shipping sand slag and crucibles from Rocky Flats directly to WIPP despite the fact that it contains a variety of reactive metals in it and it's going to seek a waiver for any safety issues associated with that. ...So it seems that these rules can be bent when it's feasible."	While the commentor's opinion about DOE embracing risk constraints when appropriate or seeking waivers for safety issues involving waste disposal is noted, the comment is beyond the scope of this EIS. The commentor also makes reference to the shipment of sand slag and crucibles from Rocky Flats directly to the Waste Isolation Pilot Project, which is also outside the scope of the EIS. However, in response to the commentor's statement, DOE would like to note the following activities regarding the shipment of sand, slag, and crucible residues to the Waste Isolation Pilot Project that were completed in 1999: (1) In July, after conducting a sampling analysis of the sand, slag, and crucible residues, DOE concluded there would be no pyrophoric hazards with this material. The analysis showed that these residues are sufficiently nonreactive to be shipped to the Waste Isolation Pilot Project. (2) DOE obtained the U.S. Nuclear Regulatory Commission approval in June 1999 for a change to shipping codes for the movement of material to the Waste Isolation Pilot Project. This revision allows DOE to ship residues with a passivated calcium constituent greater than that present in the sand, slag, and crucible residues. Basically, it has been determined that the sand, slag, and crucible residues are not hazardous waste and, therefore, are not subject to RCRA regulations. DOE has concluded, with the U.S. Nuclear Regulatory Commission approval, that disposal of these types of residues at the Waste Isolation Pilot Project will not adversely affect public health and safety.
802-5	"I'd like to see actual laboratory leach studies on samples of this fuel to see how this sodium, the residual sodium, and the driver fuel actually is [*sic*] released in the chemical form if you actually have the kinds of violent and potentially explosive reactions that are postulated. There's nothing like that in this document."	As discussed in Section E.4.6, the EBR-II fuel at INTEC's Basins 666 and 66 are stored inside sealed stainless steel cans that prevent the contact of basin water with the fuel cladding. During the average 17 years of storage in Basin 666, 10 of the 2148 cans were confirmed to have water in-leakage. With water inside these cans, a fuel-water reaction had produced hydrogen gas, which created bubbles that allowed detection of the water. These observations are consistent with the fact that sodium and metallic uranium react with water to produce hydrogen and this is the reason that all the sodium-bonded spent nuclear fuel is stored in dry storage or sealed containers that prevent the exposure of the fuel cladding to water. In a storage condition in a geologic repository, fuel cladding could disintegrate over time, leading to the collection of a large amount of sodium within the confines of the storage can. If this fuel can were to fail, a large amount of sodium would be available to react with any water in the repository. This could result in a violent reaction. DOE considers this condition to be unacceptable. The EIS, under the No Action alternative, analyzed a direct disposal option that was conditional on the acceptability of untreated sodium-bonded spent nuclear fuel in a repository. However, the feasibility and acceptability of such action remains to be determined.

Comments from the Arlington, Virginia, Public Hearing August 31, 1999		
No.	*Comments*	*DOE Responses*
802-6	"And as a matter of fact, in its evaluation of the No Action Alternative you refer to the fact that you're going to look at the question of the repository—of direct disposal of unprocessed driver fuel—and yet there's no mention of it other than we're going to do it. There's no discussion. And then that really has to be a key part. Because now we're talking about a very small amount of material [in comparison to overall inventory of the repository]."	The environmental impacts of the direct disposal of driver and blanket sodium-bonded spent nuclear fuel are discussed in Section 4.2 of the EIS. This is the option in which the sodium-bonded spent nuclear fuel would be disposed of in a geologic repository without sodium removal. Before the waste acceptance criteria are finalized, it is difficult to know whether this option is viable. It is possible, depending on how the final criteria are expressed, to demonstrate that, although metallic sodium is reactive and ignitable, its presence does not give the same characteristics to the sodium-bonded spent nuclear fuel and, therefore, untreated driver fuel could meet the criteria. As discussed in Section 2.5 of the EIS, DOE could decide on a hybrid alternative that includes no action for the driver fuel in the Record of Decision.
802-7	"Moving on, so in that regard, you also don't evaluate the option of mechanical sodium removal for the blanket fuel and direct disposal of the driver fuel. That is not one of the options that's considered and I think it should be. Right now—in other words, the No Action— combining the No Action Alternative and the Alternative Two should be another one that's considered."	As discussed in Section 2.5 of the EIS, DOE considered the separate treatment of the driver and blanket spent nuclear fuel in identifying a preferred alternative. DOE will consider this separate treatment in the Record of Decision. The environmental impact analyses in the EIS allow DOE to consider all combinations of technologies, options, and fuel types, including combinations not included among the specific combinations explicitly analyzed in the EIS. As the commentor suggests, "no action" could be considered for the driver spent nuclear fuel, and "high-integrity can packaging" for the blanket spent nuclear fuel.
802-8	"I'd just like to point out a few other inconsistencies, or just one. For instance, the uranium which is recovered from the Electrometallurgical treatment of the fuel. This is not being credited with a— it does not have a value according to the Cost Study, which is reasonable because DOE is not going to be selling any of its uranium for 10 years to support the market price in the context of the U.S.-Russian Agreement." However, you then do not consider it part of the waste stream and, since Anna Aurillo isn't here and she likes to reiterate this issue, it should be, especially if it's not a commodity that has a value. If you can't sell it, then it's a waste, and so the volume associated with that should certainly be added to the table."	The uranium recovered from the electrometallurgical treatment process contains radioactive isotopes that render it unusable as surplus uranium without further processing to remove these impurities. DOE has not yet determined the final disposition of this uranium. For the purpose of the EIS, it is assumed that metal uranium ingots from the electrometallurgical treatment process would be stored in the Materials Building within the Zero Power Physics Reactor at ANL-W. The uranium recovered from the electrometallurgical treatment process has not been treated as a waste because of its potential value if it is further processed. This uranium will be categorized when DOE determines if it will be further processed.

A.2.6 Written Comments and DOE Responses

Comments presented in this section were submitted to DOE via the U.S. mail, e-mail, toll-free number, toll-free fax line, or in person at the public hearings. All comments received during the comment period, which began on July 31, 1999, and ended on September 28, 1999, as well as submittals received after September 28, are reproduced in this section. This section provides a side-by-side display of the written comments received (full-text reproductions) and DOE's responses. Individual comments are numbered in the margins of the comment letters, and DOE responses to each of the numbered comments are provided on the right side of each page.

Commentor No. 1: Ellen Glaccum



Draft EIS Comment Form

Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

I find it mystifying that you have gone to the time & expense to issue a preferred alternative that is "no preferred alternative." I hereby request that you send me copies of the "independent" cost study & the non-proliferation report. I do commend you from pulling back from your former "leader-leader role for Argonne's electrometallurgical scheme. I question the timing of this project. Why not wait to see what the acceptance criteria at the mythical permanent repository will actually be, rather than guessing at this point in time? I am very interested in the fact that air emissions could be 2,162 curies of tritium and 32,250 curies of krypton-85 every year — will there be other radioactive air emissions? What & how much? What will the total air emissions at INEL be with this, the planned incinerator, and all other current & planned ventures? How will the SNF not currently located at INEL be transported to INEL? Will the public be informed abt transportation schedules? I demand the final EIS acknowledge that the "background radiation" has done nothing but escalate since the Trinity testing.

There are several ways to provide comments on the Draft EIS for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel and these include:

- attending public hearings and giving your comments directly to DOE representatives
- returning this comment form to the registration desk at a public hearing or to the address listed below
- calling toll-free and leaving your comments: 1-877-450-6904
- faxing your comments toll-free to: 1-877-621-8288
- commenting via e-mail: emteis@hq.doe.gov

Name (optional): Ellen Glaccum

Organization: Citizen / taxpayer

Home/Organization Address (circle one): Box 1173

City: Ketchum State: ID Zip Code: 83340

Telephone (optional):

COMMENTS MUST BE POSTMARKED BY SEPTEMBER 13, 1999

For more information contact: Susan Leeica, NE-40
U.S. Department of Energy • 19901 Germantown Road • Germantown, MD 20874
Toll-free Telephone: 1-877-450-6904 • Toll-free Fax: 1-877-621-8288
E-mail: emteis@hq.doe.gov • Website: http://www.ne.doe.gov/home/eis.html

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1-1
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Response to Commentor No. 1:

1-1: Council on Environmental Quality regulations (40 CFR 1502.14[e]) do not require a preferred alternative to be included in a draft EIS if one has not been identified at the time of publication. However, the regulations do require that a preferred alternative be identified in a final EIS. DOE initially identified electrometallurgical treatment at ANL-W as the Preferred Alternative in its Notice of Intent (64 FR 8553). However, in response to public comments received during the scoping period, a preferred alternative was not identified in the draft EIS. This was done so that the EIS would better reflect a broader range of potential treatment alternatives. Section 2.8 of this EIS identifies Alternative 1, electrometallurgical treatment, as the Preferred Alternative for the proposed action.

1-2: Copies of the Cost Study and Nonproliferation Impacts Assessment were sent to the commentor. These reports were mailed to all interested parties on August 12, 1999, during the comment period and were also made available at the public hearings on the draft EIS. Although these reports are not critical to the evaluation of the analysis presented in the EIS, they will be considered during the decision-making process in the preparation of the Record of Decision.

1-3: DOE initially identified electrometallurgical treatment at ANL-W as the proposed action in its Notice of Intent (64 FR 8553). However, in response to public comments received during the scoping period, a preferred alternative was not identified in the draft EIS. This was done so that the EIS would better reflect a broader range of potential treatment alternatives.

1-4: Although the waste acceptance criteria have not been finalized, there is substantial guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999, which is referenced in the EIS. Based on this guidance (see Section 4.12.1 of the EIS), it is highly probable that sodium-bonded spent nuclear fuel would not be acceptable in the repository without some stabilization and/or removal of the metallic sodium. Having successfully completed the Electrometallurgical Treatment Research and Demonstration Project (see Section 1.6.3) and in planning the closure of its PUREX processing capabilities, DOE needs to decide whether these processes are suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in a loss of capability and of experienced, knowledgeable technical staff, should DOE decide at a later date to use the electrometallurgical

Commentor No. 1: Ellen Glaccum

Response to Commentor No. 1 (Cont'd):

process to treat sodium-bonded spent nucler fuel. Section 1.2 of the EIS has been revised for clarification.

1-5: The maximum annual radiological gaseous (air) emissions would occur during simultaneous melt and dilute processing of the EBR-II driver and blanket spent nuclear fuel under Alternative 6. This simultaneous operation would occur over two years. The estimated total curies released during treatment of the sodium-bonded spent nuclear fuel at ANL-W under Alternative 6 would be about 4,300 curies of elemental tritium and about 67,000 curies of krypton-85. As indicated in the EIS, the radiological dose impacts from these releases to the general public residing within 80 kilometers (50 miles) of the facility would be well below regulatory limits. These two radionuclides (tritium and krypton-85) would account for greater than 99.9 percent of estimated dose to the population. Appendix E of the EIS lists all potential radionuclides that could be released by the proposed action. As indicated in this appendix, other airborne releases would be orders of magnitude smaller than these two nuclides. After two years, the krypton and tritium releases would be 520 and 70 curies per year, respectively. Overall, the radiological impacts associated with these releases would result in individual maximum doses much smaller than the 10 millirem per year limit set by the EPA for radioactive air emissions under 40 CFR 61.

1-6: As explained in Section 3.2.3.1 of the EIS, total releases of tritium and krypton-85 at INEEL from all operations during 1997 (the most currently available data) resulted in approximately 430 and 3,580 curies, respectively. The planned incinerator at INEEL, which was evaluated under the Advanced Mixed Waste Project Final EIS (DOE/EIS-0290), is expected to produce about 27 curies of tritium and a very small amount of krypton-85 per year. Releases during other, proposed and planned activities for the future are documented in various EISs that are listed in Section 1.6 of this EIS. Maximum impacts from air emissions associated treatment of the sodium-bonded spent nuclear fuel and those of future activities at INEEL are summarized in Section 4.11.1.4 of the EIS. The results clearly indicate that the cumulative impacts (collective doses to the maximally exposed offsite individual and the general public over the duration of the operation) from the expected releases would be well below the regulatory limit.

1-7: Sodium-bonded spent nuclear fuel not currently located at INEEL will be transported to INEEL in accordance with the amended Record of Decision for the DOE Programmatic Spent Nuclear Fuel EIS (61 FR 9441). All information regarding the transport of this spent nuclear fuel will be

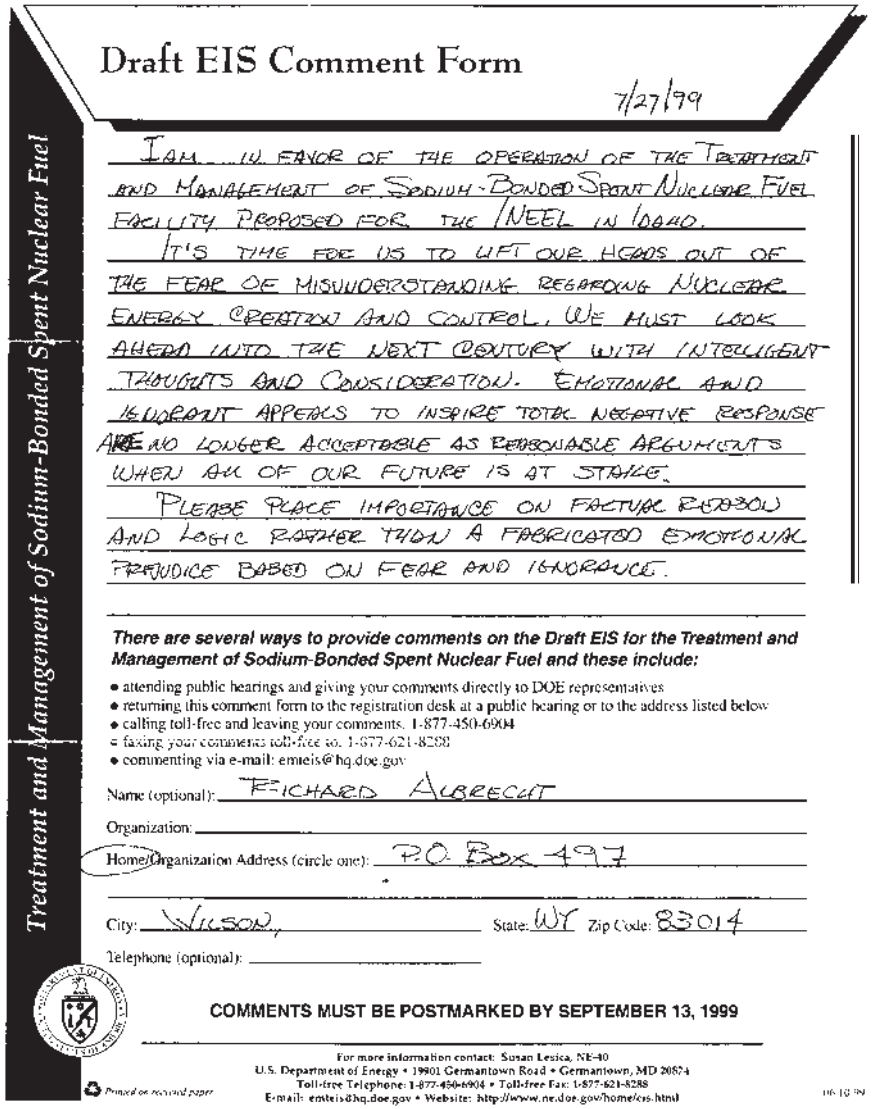
Commentor No. 1: Ellen Glaccum

Response to Commentor No. 1 (Cont'd):

disseminated in accordance with the programmatic EIS and is not considered part of the scope of this SBSNF EIS. This is discussed in Section 4.9 and Appendix G of this EIS. DOE will inform the state and Tribal governments about transportation schedules regarding the spent nuclear fuel addressed in this EIS.

1-8: As indicated in Appendix E, Section E.2.1, an average American would receive about 300 millirem per year from cosmic, terrestrial (Earth's rock formations), and natural (radon gas) radiation sources. The background radiation dose from atmospheric bomb tests (including the Trinity testing) is a fraction of 1 millirem per year.

Commentor No. 2: Richard Albrecht



Draft EIS Comment Form

7/27/99

I AM IN FAVOR OF THE OPERATION OF THE TREATMENT AND MANAGEMENT OF SODIUM-BONDED SPENT NUCLEAR FUEL FACILITY PROPOSED FOR THE INEEL IN IDAHO.

IT'S TIME FOR US TO LIFT OUR HEADS OUT OF THE FEAR OF MISUNDERSTANDING REGARDING NUCLEAR ENERGY CREATION AND CONTROL. WE MUST LOOK AHEAD INTO THE NEXT CENTURY WITH INTELLIGENT THOUGHTS AND CONSIDERATION. EMOTIONAL AND IGNORANT APPEALS TO INSPIRE TOTAL NEGATIVE RESPONSE ARE NO LONGER ACCEPTABLE AS REASONABLE ARGUMENTS WHEN ALL OF OUR FUTURE IS AT STAKE.

PLEASE PLACE IMPORTANCE ON FACTUAL REASON AND LOGIC RATHER THAN A FABRICATED EMOTIONAL PREJUDICE BASED ON FEAR AND IGNORANCE.

2-1

There are several ways to provide comments on the Draft EIS for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel and these include:

- attending public hearings and giving your comments directly to DOE representatives
- returning this comment form to the registration desk at a public hearing or to the address listed below
- calling toll-free and leaving your comments. 1-877-450-6904
- faxing your comments toll-free to. 1-877-621-8288
- commenting via e-mail: emteis@hq.doe.gov

Name (optional): RICHARD ALBRECHT

Organization:

Home/Organization Address (circle one): P.O. Box 497

City: WILSON, State: WY Zip Code: 83014

Telephone (optional):

COMMENTS MUST BE POSTMARKED BY SEPTEMBER 13, 1999

For more information contact: Susan Lesica, NE-40
U.S. Department of Energy • 19901 Germantown Road • Germantown, MD 20874
Toll-free Telephone: 1-877-450-6904 • Toll-free Fax: 1-877-621-8288
E-mail: emteis@hq.doe.gov • Website: http://www.ne.doe.gov/home/eis.html

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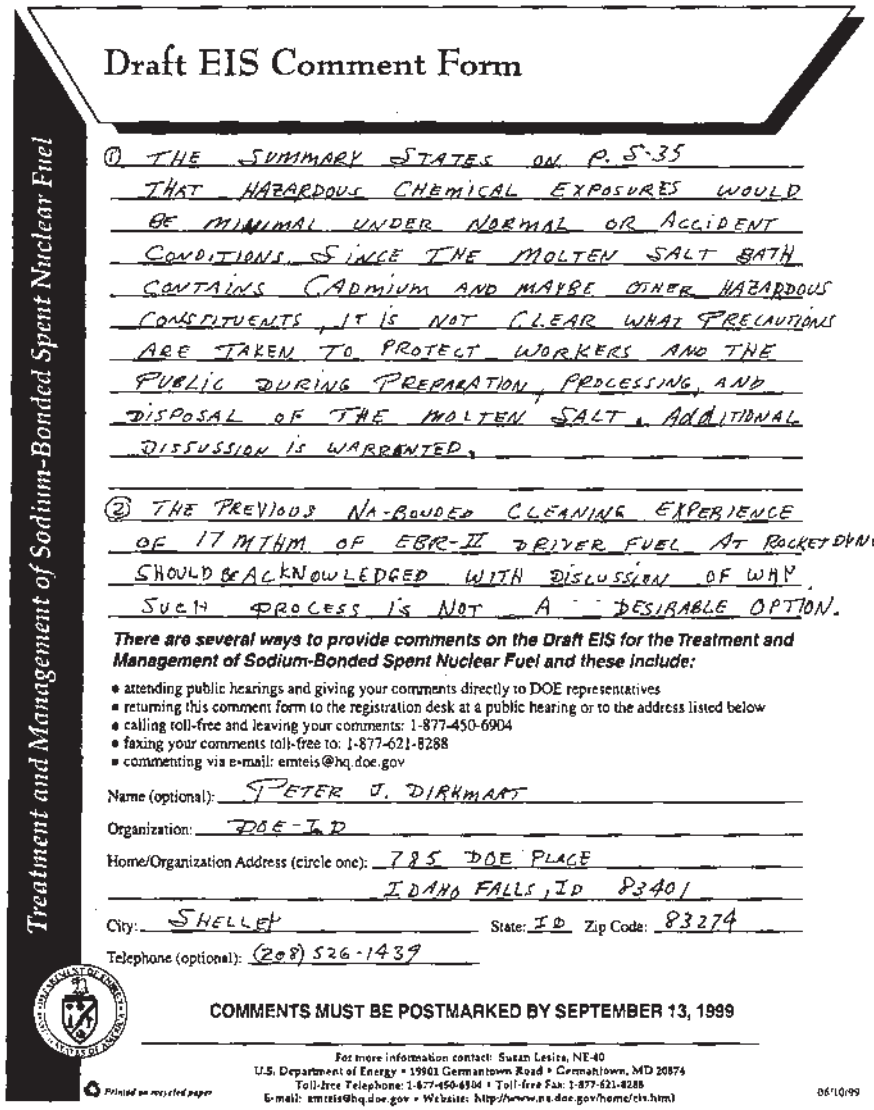
Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

Response to Commentor No. 2:

2-1: The commentor's support for the treatment and management of sodium-bonded spent nuclear fuel at INEEL is noted.

Commentor No. 3: Peter J. Dirkmaat



Draft EIS Comment Form

Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

① THE SUMMARY STATES ON P. S-35 THAT HAZARDOUS CHEMICAL EXPOSURES WOULD BE MINIMAL UNDER NORMAL OR ACCIDENT CONDITIONS. SINCE THE MOLTEN SALT BATH CONTAINS CADMIUM AND MAYBE OTHER HAZARDOUS CONSTITUENTS, IT IS NOT CLEAR WHAT PRECAUTIONS ARE TAKEN TO PROTECT WORKERS AND THE PUBLIC DURING PREPARATION, PROCESSING, AND DISPOSAL OF THE MOLTEN SALT. ADDITIONAL DISSUSSION IS WARRANTED. 3-1

② THE PREVIOUS NA-BONDED CLEANING EXPERIENCE OF 17 MTHM OF EBR-II DRIVER FUEL AT ROCKETDYNE SHOULD BE ACKNOWLEDGED WITH DISCUSSION OF WHY SUCH PROCESS IS NOT A DESIRABLE OPTION. 3-2

There are several ways to provide comments on the Draft EIS for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel and these include:

- attending public hearings and giving your comments directly to DOE representatives
- returning this comment form to the registration desk at a public hearing or to the address listed below
- calling toll-free and leaving your comments: 1-877-450-6904
- faxing your comments toll-free to: 1-877-621-8288
- commenting via e-mail: emteis@hq.doe.gov

Name (optional): PETER J. DIRKMAAT

Organization: DOE-ID

Home/Organization Address (circle one): 785 DOE PLACE

IDAHO FALLS, ID 83401

City: SHELLEY State: ID Zip Code: 83274

Telephone (optional): (208) 526-1439

COMMENTS MUST BE POSTMARKED BY SEPTEMBER 13, 1999

For more information contact: Susan Lesica, NE-40
U.S. Department of Energy • 19901 Germantown Road • Germantown, MD 20874
Toll-free Telephone: 1-877-450-6904 • Toll-free Fax: 1-877-621-8288
E-mail: emteis@hq.doe.gov • Website: http://www.ne.doe.gov/home/eis.html

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Response to Commentor No. 3:

3-1: In one of the electrorefiner designs for the electrometallurgical treatment of sodium-bonded driver spent nuclear fuel contains a layer of cadmium to allow recovery of the uranium that falls off the cathode during treatment. This electrorefiner design provides a cadmium vapor trap that collects, condenses, and returns any cadmium vapor generated during operation. In addition, ANL-W has incorporated cadmium worker safety in its operations through administrative procedures and worker training. Therefore, the workers are considered to be protected from cadmium hazards. The only abnormal condition that could lead to accidental releases of cadmium in the hot cell and the environment is hypothesized in the EIS to occur during a beyond-design-basis earthquake with an estimated frequency of 0.00001 per year. Given such an earthquake, the EIS estimates the consequences of a cadmium release to the noninvolved worker would be orders of magnitude lower than the Emergency Response Planning Guideline-1 (ERPG-1) value, so it would have a minimal impact.

3-2: The sodium cleaning process used at Rocketdyne and the reasons why this process was not explicitly evaluated in the EIS are described in revised Section 2.3.9 and Section C.2 of Appendix C of the EIS.

Commentor No. 4: Susan Pengilly Neitzel

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Governor of Idaho

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Oral History

Memberships and Outreach and Development

Publications

State Archives Manuscripts

July 29, 1999

Ms. Susan Lesica
EIS Document Manager
Office of Nuclear Energy
Science and Technology (NE-40)
19901 Germantown Road
Germantown, Maryland 20874-1290

RE: Treatment and Management of Sodium-Bonded Spent Nuclear Fuel, Argonne National Laboratory-West, Idaho National Engineering and Environmental Laboratory, Idaho

Dear Ms. Lesica:

Thank you for sending the draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel. The project may take place at Argonne National Laboratory-West.

We are concerned about any actions associated with the project that may affect potentially significant buildings and structures located at ANL-West. If interior or exterior alterations to the existing facilities are planned, we will need to receive a report containing the historic context of ANL-West and documentation of the individual facilities. We will also be requesting a final draft of the historic context for DOE-Id facilities at the INEEL for reference in evaluating properties located at ANL-West.

4-1

To prepare the report, we recommend that you contract with a cultural resource professional who meets the Secretary of the Interior's professional qualifications for historian or architectural historian. Robert Stark and the cultural resource staff at Lockheed-Martin will be able to assist you in identifying a professional contractor.

We appreciate your cooperation. If you have any questions, feel free to contact me at 208-334-3827.

Sincerely,

Susan Pengilly Neitzel
Deputy SHPO and
Compliance Coordinator

cc: Robert Stark, DOE-Id

The Idaho State Historical Society is an Equal Opportunity Employer.

Response to Commentor No. 4:

4-1: DOE has examined all reasonable alternatives that involve facilities at ANL-W, and none have been found that would have an adverse affect on the interior or exterior of any facility at the site. The alternatives vary primarily by the type of equipment that would be installed inside the Fuel Conditioning Facility, the Hot Fuel Examination Facility, and other facilities at ANL-W. There are, therefore, no alterations planned that would change the historic value of these buildings. Thus, an ANL-W historic context report is not required for the proposed action described in the EIS.

Commentor No. 5: Pat Clark

SB SNF Toll Free Line

8/5/99

Pat Clark
Snake River Alliance
hm: 208-344-3932
Snake River Alliance: 208-344-9161

I'm a concerned, well I'd like some information on the hearings that are coming up on the draft EIS of the sodium treatment. What I'd like to know is I'd like to ask if we can have a 60 day extension and I'd like to know who to direct this question to. **5-1**

Response to Commentor No. 5:

5-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

Commentor No. 6: Charles Bailey

SB SNF Toll Free Line

8/6/99

Charles Bailey
803-725-4435

I'd like to make a public comment about having the stabilization material process through the SRS F-Canyon with the melt and dilute process in the 105-L area due to the fact that we have the infrastructure in place. We have community and public support. We have Congressional and political support and we can do it cost effective and more importantly we can do it safely, more so than any other site can possibly imagine. This is my feelings on the subject and I just wanted to call and let you people know. Thank you and have a good day. **6-1**

Response to Commentor No. 6:

6-1: The commentor's support for the treatment and management of sodium-bonded spent nuclear fuel at SRS is noted.

Commentor No. 7: Jean Boyles

SB SNF Toll Free Line

8/6/99

Jean Boyles
208-343-0919

I'd like to request a 60 day extension for the comment period. Yeah, we need more information needs to be gathered. **7-1**

Response to Commentor No. 7:

7-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169). With respect to the need for more information, DOE obtained and analyzed the relevant information and made that information available to the public. Background materials were placed in public reading rooms and were made available to the public through a series of hearings held August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho; and August 31, 1999, in Arlington, Virginia. Materials placed in the reading rooms included the electrometallurgical demonstration project environmental assessment, the Finding of No Significant Impact for the environmental assessment, National Research Council interim status reports on the electrometallurgical treatment demonstration project, the 1995 Settlement Agreement and Consent Order with the State of Idaho, the scoping meeting transcripts and comments, and the draft EIS hearing presentations and fact sheets. In addition, completion of the Cost Study and Nonproliferation Impacts Assessment was expedited so that they would be available to the public during the comment period. These reports were mailed to interested parties on August 12, 1999, and were made available to attendees at all of the public hearings on the draft EIS. Although these reports are not critical to the environmental impact analysis presented in the EIS, they will provide input to the Record of Decision. While the final National Research Council report on the demonstration project was published in April 2000, interim status reports were produced throughout the project. Data generated during the demonstration project were used in preparing the EIS, as discussed in Section 1.6.3 of the EIS.

Commentor No. 8: Lowell Jobe

SB SNF Toll Free Line

8/12/99

Lowell Jobe
Coalition 21
14469 N 55th East
Idaho Falls, ID 83401
208-524-7271
fax: 208-524-0998

I received the copies of the documents pertain to the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel DEIS. However, on page S-6 and S-7 they refer to two things that I was interested in and would like to receive either information as to whether it is available or copies of those documents and the two of them deal with the costs as referred to on page S-6 and also the nuclear nonproliferation items. Both of them were supposed to be expedited so they would available about the same time as the main DEIS. However, I believe since I'm working for Coalition 21 on evaluating the document I would like to receive these two which I think are an integral part of the entire problem. **8-1**

Response to Commentor No. 8:

8-1: Copies of the Cost Study and Nonproliferation Impacts Assessment were sent to the commentor. DOE did expedite completion of the Cost Study and the Nonproliferation Impacts Assessment. These reports were mailed to interested parties on August 12, 1999, and were made available to attendees at the public hearings on the SBSNF Draft EIS. These public hearings were held on August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho; and August 31, 1999, in Arlington, Virginia. Although these reports are not critical to the environmental impact analysis presented in the EIS, they will provide input to the Record of Decision.

Commentor No. 9: Laird Irvin

SB SNF Toll Free Line

8/18/99

Laird Irvin
PO Box 2885
Ketchum, ID 83340

I'd like to get a 60 day extension on the comment period so we can further work on this. **9-1**

Response to Commentor No. 9:

9-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

Commentor No. 10: Betina Mattesen

B. Mattesen
434 Lower Notch
Bristol, VT 05443

PM

USA20

Ms Susan Losica
US Dept of Energy, Office of Nuclear
Fac. Management NE 40
19901 Germantown Rd
Germantown, Maryland 20874-1290

I would like to comment on the Draft EIS for the Management of Sodium-Bonded Spent Nuclear Fuel. I am concerned about the wasteful cost and environmental problems of increased nuclear waste. The US has nonproliferation goals and this technology runs counter to that. The comment period must be extended - the EIS omits cost analysis of alternatives, Nat. Academy of Science review + a plan for waste disposal, among other things. A 60 day extension is requested.
Thank you.
Betina Mattesen

10-1
10-2
10-3
10-4
10-5
10-6
10-3

Response to Commentor No. 10:

10-1: Chapter 4 of the EIS presents data that demonstrates that, compared to leaving the sodium-bonded spent nuclear fuel in its current form, treatment and management of the sodium-bonded spent nuclear fuel would significantly reduce the volume of high-level radioactive waste that needs to be disposed of in a geologic repository. Cost is not part of the scope of this EIS. A Cost Study was completed and distributed to interested public members during the public comment period.

10-2: The assessment of nonproliferation impacts is not a part of the EIS process; however, it should be noted that DOE's Office of Arms Control and Nonproliferation assessed the potential nonproliferation impacts that may result from each of the alternatives and technologies analyzed in this EIS. This Nonproliferation Impacts Assessment stated that, for this specific application, all alternatives except PUREX processing at SRS are fully consistent with U.S. policy with respect to reprocessing and nonproliferation.

10-3: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

10-4: The SBSNF EIS was prepared in accordance with NEPA, Council on Environmental Quality regulations on implementing NEPA (40 CFR 1500-1508), and DOE's NEPA implementation procedures (10 CFR 1021). None of these require the inclusion of a cost analysis in an EIS. As discussed in the introduction, the basic objective of this EIS is to provide the public and DOE decision-makers with a description of the reasonable alternatives for treatment and management of DOE's sodium-bonded spent nuclear fuel and their potential environmental impacts. However, DOE has issued a separate Cost Study that analyzes and compares the costs of the alternatives analyzed in the EIS. Cost will be considered during the decision-making process in preparing the Record of Decision.

10-5: The National Academy of Sciences' National Research Council prepared interim status reports on the results of the Electrometallurgical Treatment Research and Demonstration Project that have been reviewed by DOE. The National Research Council completed their evaluation of the electrometallurgical treatment demonstration project in September 1999 and published their final summary report in April 2000. The final report findings will be considered during the decision-making process leading to the Record of Decision.

Commentor No. 10: Betina Mattesen

Response to Commentor No. 10 (Cont'd):

10-6: The EIS identifies and quantifies the volume and type of waste for each alternative. A geologic repository is planned to be completed and licensed to receive spent nuclear fuel and/or high-level radioactive waste. The EIS assumes that high-level radioactive waste and/or spent nuclear fuel from each alternative of this EIS would be sent to this geologic repository. Section 4.1.2 of the EIS discusses the planned disposition of other waste generated by the proposed action.

Commentor No. 11: Susan Mathees

SB SNF Toll Free Line

8/19/99

Susan Mathees
Ketchum, ID
208-726-3471

I am requesting a 60 day extension of the comment period for the pyroprocessing draft EIS hearing schedule. I'll comment later on the rest. But please make note that it's a 60 day extension request for the comment period. Thanks very much. **11-1**

Response to Commentor No. 11:

11-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

Commentor No. 12: Jeep Hardinge

SB SNF Toll Free Line

8/23/99

Jeep Hardinge
Ketchum, ID 83340
208-726-4819

I would like to request an extension on the comment period for the pyroprocessing draft EIS hearing period, comment period. And feel that there will be more information available following the closing of the scheduled comment period of September 13 and would request an extension of the comment period. Thank you. **12-1**

Response to Commentor No. 12:

12-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169). With respect to the need for more information, DOE obtained and analyzed the relevant information and made that information available to the public. Background materials were placed in public reading rooms and were made available to the public through a series of hearings held August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho; and August 31, 1999, in Arlington, Virginia. Materials placed in the reading rooms included the electrometallurgical demonstration project environmental assessment, the Finding of No Significant Impact for the environmental assessment, National Research Council interim status reports on the electrometallurgical treatment demonstration project, the 1995 Settlement Agreement and Consent Order with the State of Idaho, the scoping meeting transcripts and comments, and the draft EIS hearing presentations and fact sheets. In addition, completion of the Cost Study and Nonproliferation Impacts Assessment was expedited so that they would be available to the public during the comment period. These reports were mailed to interested parties on August 12, 1999, and were made available to attendees at all of the public hearings on the draft EIS. Although these reports are not critical to the evaluation of the analysis presented in the draft EIS, they will provide input to the Record of Decision. While the final National Research Council report on the demonstration project was published in April 2000, interim status reports were produced throughout the project. Data generated during the demonstration project were used in preparing the EIS.

Commentor No. 13: Ernest S. Chaput

ECONOMIC DEVELOPMENT PARTNERSHIP
Serving Aiken & Edgefield Counties

Fred E. Humes
Director

Comments for the Record
Treatment and Management of Sodium-Bonded Spent Nuclear Fuel
Draft Environmental Impact Statement

My name is Ernest S. Chaput and I represent the Economic Development Partnership of Aiken and Edgefield Counties, South Carolina. The Savannah River Site is located immediately adjacent to Aiken, South Carolina. The Partnership routinely reviews and provides comment on proposed Department of Energy activities which may be conducted at SRS for consistency with local capabilities and community expectations.

We have three comments regarding the subject draft EIS:

- We support Department efforts to safely manage and prepare spent nuclear fuel for disposal in the National Repository. We believe that the Federal Government has the obligation to expeditiously place these and other waste materials into forms which will provide adequate long-term protection of the public health and environment. These sodium-bonded fuels are no exception. Unless the Department has an unequivocal commitment that these fuels will be accepted in the National Repository without treatment, then **we believe that treatment is mandatory**. **13-1**

- We note that two of the six alternatives included in the draft EIS include the shipment of a portion of these fuels to the Savannah River Site for treatment. Alternative three treats blanket elements in the SRS canyons by the PUREX process. Alternative five treats blanket elements in the proposed SNF Melt and Dilute facility. As policy, we do not support the shipment of waste materials to SRS unless it can be clearly demonstrated that the SRS has a significant capability advantage to perform the task which cannot be reasonable established at the generating site. That is not the case for these sodium-bonded fuels. The draft EIS identifies the electrometallurgical facility which currently exists at Argonne-West, and it appears that this facility can adequately prepare the Sodium-bonded SNF for shipment to the National Repository. Because an adequate treatment capability currently exists at Argonne-West, **we object to the shipment of these wastes to the Savannah River Site.** **13-2**

- If the Department determines that shipment of blanket elements to the Savannah River Site is in the national interest, then **we strongly recommend that only the PUREX treatment option (Alternative three) be considered.** Our reasons are twofold: **13-3**

  The PUREX process is currently operational at SRS, and its waste form has the highest probability of acceptance at the National Repository. The vitrification of canyon high level liquid wastes in the Defense Waste Processing Facility has been

Post Office Box 1708 Aiken, SC 29802 171 University Parkway USCA
(803) 648-3362 FAX (803) 641-3369 edpsc@aol.com http://www.edpsc.org

Response to Commentor No. 13:

13-1: The commentor's support for the treatment and management of sodium-bonded spent nuclear fuel to facilitate its disposal in a repository is noted.

13-2: The commentor's objections to the shipment of spent nuclear fuel to SRS for treatment is noted. The selection of reasonable alternatives evaluated in the EIS was made in accordance with the Council on Environmental Quality Regulations (40 CFR 1500-1508) and DOE's NEPA-related regulations (10 CFR 1021) and procedures. In addition, as discussed in Section 1.3 of the EIS, the selection of reasonable alternatives is responsive to the issues raised during the public scoping period.

13-3: The commentor's preference for the PUREX process over the melt and dilute process at SRS is noted. The environmental impacts of all potential technologies are evaluated in the EIS and these will be considered, along with the assessments in the Nonproliferation Impacts Assessment and the Cost Study, during the decision-making process prior to publication of the Record of Decision. It should be noted that, although vitrified high-level radioactive waste meets current repository waste acceptance criteria, DOE expects that other waste forms would also be acceptable. DOE does not envision a situation in which sodium-bonded spent nuclear fuel would be shipped to SRS without the assurance of its ultimate disposition.

13-4: The commentor's objection to the melt and dilute process at SRS is noted. Although the products of the melt and dilute treatment process and those of the other treatment technologies have not been evaluated using existing waste acceptance criteria, it is expected that these products will be acceptable under the final waste acceptance criteria for the geologic repository when they are available. DOE does not envision a scenario in which blanket sodium-bonded spent nuclear fuel would be shipped to SRS for treatment without the assurance of its ultimate disposition.

13-5: Congress determines how funds are allocated. DOE spends monies consistent with Congressional direction. DOE is not in a position to make the difficult tradeoffs that may be required between alternative Federal programs and spending priorities. The issue of funding for the treatment and management of sodium-bonded spent nuclear fuel is beyond the scope of the SBSNF EIS.

Commentor No. 13: Ernest S. Chaput (Cont'd)

extensively reviewed and meets Repository acceptance criteria. Thus **we are assured that the wastes brought into South Carolina have a path out to final disposition.**

13-3 (Cont'd)

The Melt and Dilute process is currently in the development phase and the proposed waste form has not been extensively reviewed for acceptance in the National Repository. The Melt and Dilute program is currently underfunded and behind schedule. The inclusion of sodium-bonded blanket materials will further complicate process development and facility operation. There is no assurance that the product form from treatment of sodium-bonded fuels by the Melt and Dilute process will be subsequently shipped to the National Repository. Thus we are faced with the possibility that **sodium-bonded fuel could be shipped to South Carolina with no path out to final disposition. This is an unacceptable situation.**

13-4

It is essential that adequate budgetary resources are provided to Savannah River to meet the incremental facility operating and processing costs of treating this fuel. **We object to consideration of any Savannah River Site option without a firm DOE commitment for incremental funding**.

13-5

In summary, we support DOE efforts to prepare the subject fuels for shipment to the National Repository; however we believe that treatment should be performed at Argonne-West if at all possible. If Savannah River capabilities are to be considered for treatment, then only the PUREX process should be considered and only if adequate financial resources are provided.

13-1
13-2
13-3

Thank you for the opportunity to comment on this draft EIS.

Response to Commentor No. 13 :

Commentor No. 14: Don McWhorter

Draft EIS Comment Form

Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

1. The presented waste volumes do not seem technically correct. The PUREX are overstated and electrometallurgical process is understated. — 14-1
2. Why doesn't the EIS consider disposition? The PUREX could dispose of the uranium via the Surplus HEU Disposition as commercial fuel. The electrometallurgical process will require additional processing before disposal. — 14-2, 14-3
3. Sodium is easily removed and should not be considered technically difficult — 14-4
4. The fuel can be chopped prior to the PUREX and the S/S could disposed as low level waste. This option should be included in option 3 — 14-5
5. Better describe what happens to the uranium ingots produced by the electrometallurgical process. — 14-3

There are several ways to provide comments on the Draft EIS for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel and these include:

- attending public hearings and giving your comments directly to DOE representatives
- returning this comment form to the registration desk at a public hearing or to the address listed below
- calling toll-free and leaving your comments: 1-877-450-6904
- faxing your comments toll-free to: 1-877-621-8288
- commenting via e-mail: sodium.fuel.eis@hq.doe.gov

Name (optional): Don McWhorter

Organization:

Home/Organization Address (circle one): 304 Greenwood Drive

City: North Augusta State: SC Zip Code: 29841-2007

Telephone (optional): (803) 278-0017

COMMENTS MUST BE POSTMARKED BY SEPTEMBER 13, 1999

For more information contact: Susan Lesica, NE-40
U.S. Department of Energy • 19901 Germantown Road • Germantown, MD 20874
Toll-free Telephone: 1-877-450-6904 • Toll-free Fax: 1-877-621-8288
E-mail: sodium.fuel.eis@hq.doe.gov • Website: http://www.ne.doe.gov/home/eis.html

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Response to Commentor No. 14:

14-1: The waste volumes given in the EIS are the final solid disposal volumes. The waste volumes generated from the PUREX processing of declad and cleaned blanket spent nuclear fuel, presented in Chapter 4 of the EIS, are consistent with those presented in the SRS Spent Nuclear Fuel Management EIS for processing similar spent nuclear fuel. For example, the SRS Spent Nuclear Fuel Management EIS estimated that the PUREX processing of about 20 metric tons of heavy metal of declad and cleaned blanket spent nuclear fuel would produce a total of 170 cubic meters of liquid high-level radioactive waste. As described for Alternative 3 in this EIS, PUREX would process about 57 metric tons of heavy metal of cleaned and declad blanket spent nuclear fuel. Therefore, it was estimated that PUREX processing would generate about 510 cubic meters (667 cubic yards) of liquid high-level radioactive waste. Section 4.5.6 of the EIS describes waste generation from the PUREX processing of cleaned and declad blanket spent nuclear fuel. Estimates of the ceramic and metallic high-level radioactive waste volumes generated during electrometallurgical treatment were based on the type of fuel, zeolite, glass frit, and process characteristics, all of which are known quantities. The volume of high-level radioactive waste generated by electrometallurgical treatment that were reported in the SBSNF EIS were based on data generated from the completed demonstration project at ANL-W.

14-2: As described in Section 2.6 of the EIS, PUREX processing would not be used to treat the sodium-bonded driver spent nuclear fuel. Treatment of cleaned (sodium removed) and declad blanket spent nuclear fuel at SRS' F-Canyon (via the PUREX process) would not generate highly enriched uranium; it would produce depleted uranium. The electrometallurgical treatment process would separate the highly enriched uranium from the driver spent nuclear fuel and would downblend it to low enriched uranium. A separate NEPA action will address the disposition of uranium.

14-3: As discussed in Appendix C, Section C.1, the products of the electrometallurgical treatment are: uranium metal ingots, metallic waste forms, and ceramic waste forms. The metallic and ceramic waste forms would be considered high-level radioactive waste and would be certified for disposal in a geologic repository in accordance with repository acceptance criteria. Although the acceptance criteria are still not finalized, it is not expected that additional processing would be required for the certification of these waste forms. The uranium metal ingots, containing low enriched uranium (from the treatment of driver fuel) or depleted uranium

Commentor No. 14: Don McWhorter

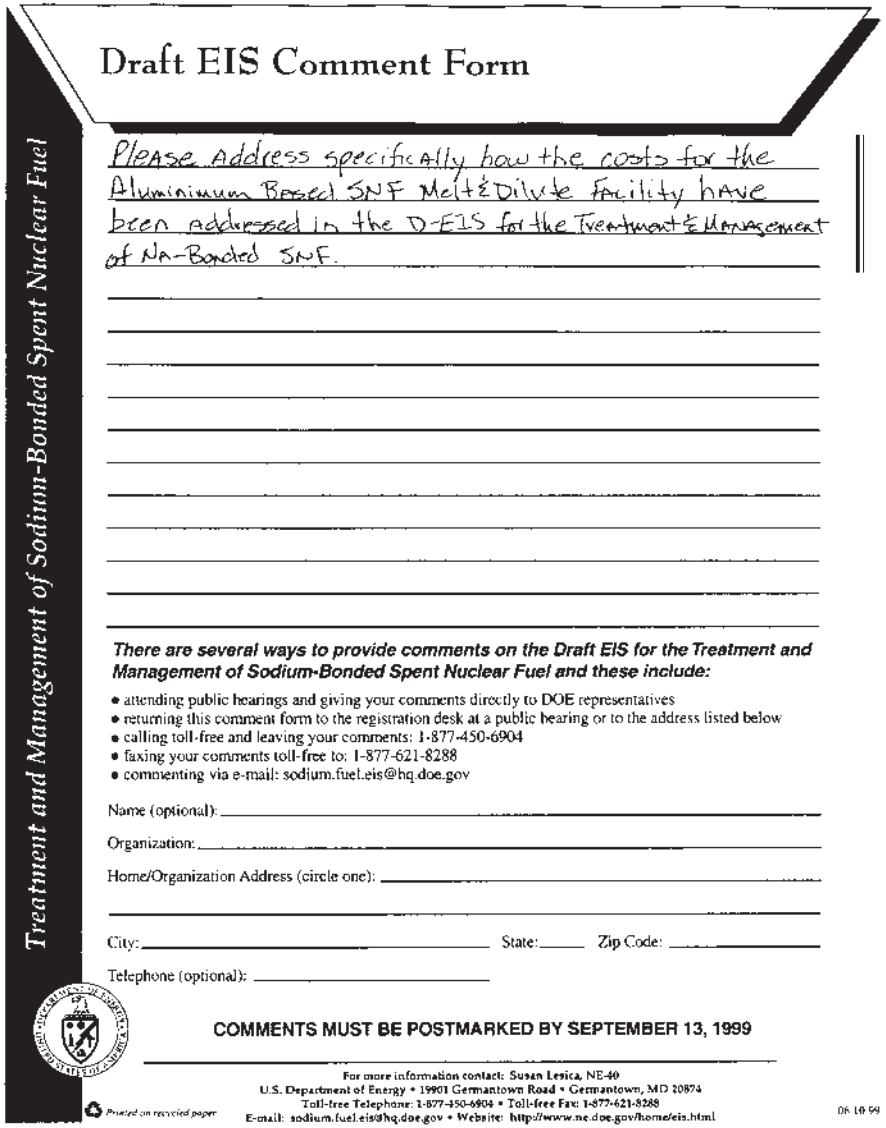
Response to Commentor No. 14 (Cont'd):

(from the treatment of blanket fuel) are not currently considered high-level radioactive waste, and are not destined for disposal in a geologic repository. Their final disposition, further use or disposal, will be determined in a future NEPA review.

14-4: As discussed in Section 2.2 of the EIS, the physical presence of sodium in the driver sodium-bonded spent nuclear fuel is different than that in the blanket spent nuclear fuel. Consequently, the technique and degree of difficulty for its removal depends on the type of the fuel. The EIS describes these techniques in Section 2.3.9.

14-5: As discussed in Section 2.6, the possibility of treating driver or cladded blanket spent nuclear fuel using the SRS PUREX Process was considered and dismissed from further evaluation because of the significant design modifications that would be required at SRS.

Commentor No. 15: Anonymous



Draft EIS Comment Form

Please address specifically how the costs for the Aluminum Based SNF Melt & Dilute facility have been addressed in the D-EIS for the Treatment & Management of Na-Bonded SNF.

15-1

Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

There are several ways to provide comments on the Draft EIS for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel and these include:

- attending public hearings and giving your comments directly to DOE representatives
- returning this comment form to the registration desk at a public hearing or to the address listed below
- calling toll-free and leaving your comments: 1-877-450-6904
- faxing your comments toll-free to: 1-877-621-8288
- commenting via e-mail: sodium.fuel.eis@hq.doe.gov

Name (optional): _____

Organization: _____

Home/Organization Address (circle one): _____

_____

City: _____ State: _____ Zip Code: _____

Telephone (optional): _____

COMMENTS MUST BE POSTMARKED BY SEPTEMBER 13, 1999

For more information contact: Susan Lesica, NE-40
U.S. Department of Energy • 19901 Germantown Road • Germantown, MD 20874
Toll-free Telephone: 1-877-450-6904 • Toll-free Fax: 1-877-621-8288
E-mail: sodium.fuel.eis@hq.doe.gov • Website: http://www.ne.doe.gov/home/eis.html

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Response to Commentor No. 15:

15-1: Actual costs for the treatment and management of sodium-bonded spent nuclear fuel are not part of the EIS process. The SBSNF EIS was prepared in accordance with NEPA, Council on Environmental Quality regulations on implementing NEPA (40 CFR 1500-1508), and DOE's NEPA implementation procedures (10 CFR 1021). None of these require the inclusion of a cost analysis in an EIS. As discussed in the introduction, the basic objective of this EIS is to provide the public and DOE decision-makers with a description of the reasonable alternatives for the treatment and management of DOE's sodium-bonded spent nuclear fuel and their potential environmental impacts. However, DOE has issued a separate Cost Study that analyzes and compares the costs of the alternatives analyzed in the EIS. An estimate of the costs associated with treating sodium-bonded spent nuclear fuel using the melt and dilute facility at SRS is provided in Section 2.6 and Appendix B.2 of the Cost Study.

Commentor No. 16: Patricia McCracken

To: Department of Energy

August 12, 1999

From: Patricia McCracken
413 Scotts Way
Augusta, Georgia 30909
706-738-9451
fax 706-738-0637

Re: Draft Environmental Impact Statement for the treatment and management of Sodium-bonded spent Nuclear Fuel

Questions:

How do the alternatives rank in **energy consumption?** **16-1**

How important is **the experience of the workforce** in the selection process? **16-2**

Who has the **patents** on the processes presented? **16-3**

How well equipped are the facilities to handle any **accidents that may relate to this treatment**? What would happen if a **power outage** or **overload** occurred during the electric voltage of the electrometallurgical treatment process? **16-4** **16-5**

What is the agency planning to do with the **filters** used to capture the off-gases of the melt and dilute process? What is the name of the filters to be used and how much do they cost? **16-6** **16-7**

What is the anticipated **treatment of the filters** and how will they be categorized as a waste stream? Page S-10 of the Summary (DOE/EIS-0306D July 1999. **16-6**

What happens to the **salt(electrometallurgical treatment process) that is removed and solidified**? What is the **disposal method**? **What is the level of contamination of the salt that becomes sorbed into the zeolite structure**? How much does the glass powder cost(and who makes it) that is added to the zeolite mixture? Current market prices? **16-8** **16-9**

What is the level of voltage that is required for the application described on page S-13? Does this voltage vary **16-10**

Response to Commentor No. 16:

16-1: The six alternatives analyzed in this EIS use the existing infrastructure at the both INEEL and SRS sites. Section 2.4 of the EIS identifies the facilities within the sites where treatment and management of the sodium-bonded spent nuclear fuel would occur. These facilities currently exist and are operational. The site-wide infrastructure characteristics are given in Sections 3.2.2 and 3.3.2 of the EIS, including annual energy consumption at each site. The energy consumed by the facilities that would be used to treat the sodium-bonded spent nuclear fuel is a small fraction of the total energy used at each site. Furthermore, none of the technologies evaluated appears to demand significantly higher or lower energy to treat the spent nuclear fuel. Section 4.14.3 provides a discussion on the relative energy consumption associated with technologies evaluated in the EIS.

16-2: Work force experience will be one of many factors taken into consideration by DOE when it selects an alternative for the treatment and management of its sodium-bonded spent nuclear fuel. At present both ANL-W and SRS have work forces that have the experience necessary to perform any of the proposed alternatives. The potential loss of experienced personnel at ANL-W was one of the factors considered when it was decided to proceed with the EIS at this time.

16-3: ANL-W did not produce any patents during the demonstration project. However, the scientists and engineers who developed the processes used in the Electrometallurgical Treatment Research and Demonstration Project patented a number of inventions related to the processes and the process equipment. Four patents were issued to cover production of the ceramic waste forms. Four more patents were issued for electrorefiner and electrorefining process inventions related to the demonstration project. All of the patents associated with the treatment processes presented in the EIS are owned by the U.S. Government.

16-4: The management facilities identified for the treatment and management of the sodium-bonded spent nuclear fuel (see Section 2.4 of this EIS) are equipped to handle spent nuclear fuel. Each facility has a well defined, approved Safety Analysis Report that documents the equipment needed to prevent and mitigate a spectrum of accidents with a likelihood of occurrence ranging from anticipated to extremely unlikely.

16-5: A disturbance in electric power supply during electrometallurgical treatment would not cause any damage to the equipment and would not lead to accidental releases of radiation to the atmosphere. The facilities where the

Commentor No. 16: Patricia McCracken (Cont'd)

16-10 (Cont'd)

from the voltage of other uses of the facilities being considered? **What is the price of the energy at each site?** 16-11

How much does zeolite cost? 16-12

Page S-13 states that, "In addition to the ceramic and metal waste forms of high level radioactive waste, some **low-level radioactive waste would be generated." Where will this waste be stored, treated or** disposed? How low is low? 16-13

Can the low-enriched **uranium ingots be blended to be more enriched**? What are the radiological numbers for the ingots? 16-14

Has the **Purex process been modified since 1954** as described in the EIS? 16-15

Does DOE have the technology to address the incompatibility of alloys with the SRS dissolution process as described in the EIS on page S-14? 16-16

Please indicate which one of the comments in the EIS was from SRS? 16-17

Does the Purex process produce materials that could receive some treatment at the MOX facility to be built at SRS? 16-18
Does any other EIS have a process that would also help with this waste? This would be cost savings. 16-19 16-20

The University of Missouri announced some kind of new technology regarding nuclear packaging. **Does this EIS have a process for evaluating various new technologies** that may be under investigation? 16-21

The section S.3.3 on S-14 is confusing as it raises the question of why you should declad and /or do sodium removal when the waste can be packaged for shipment to a repository. The cover sheet states that, "One type of spent nuclear fuel that may not be suitable for disposal in a geologic repository without treatment is the DOE-owned sodium-bonded spent nuclear fuel." **What does "may not" mean?** 16-22

Does the waste stream vary in components from say batch to batch? Has DOE conducted a comprehensive review of all waste? **May not** does not sound like something that would be 16-23 16-24 16-22

2

Response to Commentor No. 16: (Cont'd)

treatment would be performed are equipped with multiple electric feeders and have onsite emergency diesel generators to power the equipment needed to maintain the process in a safe condition.

16-6: The off-gas system in the melt and dilute process would capture various nuclides such as cesium, tellurium, and iodine that have boiling points below or up to 1,400 °C (2,250 °F), and would be vaporized during the heating and melting process. The vaporized nuclides would be condensed and absorbed. In addition, the process would generate small quantities of oxidized actinides (e.g., plutonium, americium) that would also be captured in the filters. Depending on the level of contamination of the filters, they will be disposed of as either low-level or high-level radioactive waste. As indicated in Section 4.7.6 of the EIS, these filters would be periodically cleaned and decontaminated. The decontamination of the filters and the absorbent used to collect the volatile nuclides would produce high-level radioactive waste to be disposed of in a DOE standardized canister. The filters have not yet been designed and built. They are expected to be adsorbent to collect the volatile and gaseous fission products. Absorbents like zeolites may be used to collect cesium. Zeolite costs approximately $10 per pound. A high-efficiency particulate air filter also would be used.

16-7: The filters have not yet been designed and built, although successful tests of filter media have been conducted; therefore, the costs for the filters have not been finalized. The actual costs for the filters that would be used during treatment and management of the sodium-bonded spent nuclear fuel are not part of the EIS scope.

16-8: As described in Section 2.3.1 and Section C.1 of Appendix C of the EIS, the salt removed from the electrorefiner would be solidified, crushed, and milled; mixed with zeolite and heated where the salt is sorbed into zeolite; mixed with glass frit; and converted into a monolithic ceramic waste in a hot isostatic press. The ceramic waste form would be expected to be disposed of as a high-level radioactive waste in a geological repository. The salt would contain almost all of the fission products, including cesium and transuranic elements from the spent nuclear fuel, and would be highly radioactive.

16-9: The glass is manufactured commercially by PEMCO. For orders on the research and development scale, it costs approximately $10 per pound. The actual costs for the glass powder that would be used during the treatment and management of sodium-bonded spent nuclear fuel are not part of the EIS scope.

Commentor No. 16: Patricia McCracken (Cont'd)

stated in a document that has reached this stage of public comment?

Please explain the regulatory reasons for such a statement?

16-22

What did Argonne National Laboratory-West do with the research material? Did they produce any patents?

16-25

The EIS is vague on the subject of the reactive problems of the presence of metallic sodium; "**frequently by metallic uranium, which is stated to be potentially reactive; and in some cases, highly enriched uranium.**" **The examples of** metallic sodium reacting with water to produce hydrogen gas and sodium hydroxide did not give chemical formulars for these properties or volumes as compared to what? The repository problems are vague also. **Your explanations are not reasonable.**

16-26

Where is the explanation or details for stating that there is some "**uncertainty**" surrounding the acceptability of DOE spent nuclear fuel for placement in a potential geologic repository? **Please give all sources that you relied on to make that statement.**

16-27

Where can we locate the **Settlement Agreement and Consent** Order (Idaho 1995) issued on October 17, 1995, in the actions of Public Service Co. of Colorado v. Batt, No. CV 91-0035-S-EJL (D.Id.) and United States v. Batt, No. CV 91-0054-EJL(D.Id). The EIS states that 98% of the the fuel is somehow governed by this settlement and consent order. This information should be part of the EIS. **Is DOE under the consent order or free to consider other comments?** One of the comments in Appendix A states: "Political decisions, such as the Idaho Settlement Agreement (which says that spent nuclear fuel must be out of Idaho by 2035) should not preclude any of the No Action Alternatives from being considered."

16-28

Does any of DOE's global partners have any of this waste and what do they do?

Did any of the comments come from DOE's global partners?

16-29

Why did you issue an EIS without some comparative costs with each process and location?

16-30

3

Response to Commentor No. 16 (Cont'd):

16-10: During electrorefining operations, the voltage between the electrorefiner's electrodes is maintained below 1.3 volts. The electricity for the in-cell equipment comes from 480/208 volt power supplies. The electrorefining operation has been demonstrated over the last three years. The voltages employed at the electrorefiner do not have an effect on other voltage requirements for the facility.

16-11: The price of electricity at different sites is not a discriminating feature between the alternatives. The actual costs for the energy that would be consumed during treatment and management of the sodium-bonded spent nuclear fuel are not part of the EIS scope.

16-12: Zeolite costs approximately $10 per pound.

16-13: As described in the waste management subsections of Chapter 4 of the EIS, each of the processes would generate some volume of low-level radioactive waste at INEEL. This low-level radioactive waste would be packaged in management facilities at INEEL and sent to the Waste Experimental Reduction Facility for volume reduction (e.g., compaction), and then would be disposed of at the Radioactive Waste Management Complex. Low-level radioactive waste is defined in DOE Order 435.1 and in the glossary of the EIS. As explained in Section 3.2.11.4 of the EIS, the level of contamination must be below 10 nanocuries per gram to be disposed of on site. The low-level radioactive waste generated by the electrometallurgical treatment process meets this definition.

16-14: If low-enriched uranium ingots are blended with a more highly enriched uranium metal, then the enrichment of the new ingot will be higher than the original low-enriched uranium ingots, but lower than the material with which it was blended. Conversely, if low-enriched uranium ingots are blended with a lower-enriched uranium metal, then the enrichment of the new ingot will be lower than the original low-enriched uranium ingot. The uranium ingots would contain trace contamination from some fission products and actinide elements, and would generate a radiation field of about 1 to 10 rad per hour at contact, which would require shielding and remote handling. However, DOE plans to blend down the uranium metal derived from the electrometallurgical process.

16-15: The PUREX process described in the EIS is the same as that which is currently in operation at SRS's F-Canyon. PUREX has been used since 1954 and is a well-known process. While the F-Canyon has undergone

Commentor No. 16: Patricia McCracken (Cont'd)

SRS has been chosen for several missions and it would seem that cumulative activity would be important for solving unknown problems that might arise. Are two heads better than one in this science arena? **16-31**

Has this type of material ever undergone some treatment? There is some reference to remaining EBR-II spent nuclear fuel. **16-32**

How many alternatives have been dismissed and how many alternative processes are in a research stage in this science? **16-33**

In the Appendix DOE responses page A-7: **Information on cost will be made available to the public via the Cost Analysis Report, which will be issued during the Draft EIS public** comment period. We requested the package for the hearing in North Augusta on August 17, 1999. We did not receive the Cost Analysis Book in the DOE package. We received a cover letter and three volumes of material including DOE/EIS-0306D summary and volume I and volume II. **16-34**

Please indicate where DOE has this information? We would like to comment at the public meeting in North Augusta. We have called every number in the cover page of the material and left messages.

Who is preparing the comment books and who is responsible for printing the material for the public? **Who is reading the material that is going to the public?** **16-35**

Thank You to be continued….

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Response to Commentor No. 16 (Cont'd):

various safety upgrades through the years, the main process itself has remained essentially unchanged.

16-16: The dissolution technology used to process spent nuclear fuel containing zirconium is well-known. A processing plant operated by Nuclear Fuel Services Inc., known as West Valley, operated from 1972 to 1978. There is also a Fluorinel Dissolution Process Facility at INEEL's INTEC facility that can process spent fuel containing zirconium. However, this facility is permanently shut down. The use of dissolution technology was considered in the list of alternatives, but was dismissed from evaluation in Section 2.6 of the EIS.

16-17: It is not clear whether the commentor is referring to technical support provided by SRS in the preparation of the EIS or public comments received from the SRS region. DOE and contractor personnel from SRS provided technical support in preparing and reviewing the EIS, especially sections that involve SRS facilities and the PUREX and melt and dilute treatment processes. Commentors on the draft EIS are identified in the comment response section of the EIS.

16-18: PUREX processing of declad and cleaned blanket spent fuel at SRS would separate plutonium from the depleted uranium and fission products in the spent fuel. The separated depleted uranium and plutonium would be stored at SRS until decisions are made about their disposition. The decision to use these materials at the mixed oxide (MOX) facility is beyond the scope of this EIS.

16-19: Some of the processes evaluated in this SBSNF EIS are also included in other EISs (e.g., the Savannah River Spent Nuclear Fuel Management EIS addresses conventional processing [PUREX], melt and dilute, and electrometallurgical treatment technologies). All potential processes have been considered for their applicability and feasibility in treating sodium-bonded spent nuclear fuel.

16-20: There is no opportunity for cost savings except for selecting the least costly treatment and management alternative in the Record of Decision. The actual costs for treating and managing sodium-bonded spent nuclear fuel are not part of the EIS process. The costs of treating and managing the sodium-bonded spent nuclear fuel are addressed in a separate Cost Study that was issued by DOE in August 1999.

Commentor No. 16: Patricia McCracken (Cont'd)

To: DOE

From: Patricia McCracken
413 Scotts Way
Augusta, Georgia 30909
706-738-9451

Re: Comments: DOE/EIS-0306D continuation of comments first sent to DOE on August 11, 1999
August 12, 1999

Page C-11 states that, "Sodium-based uranium oxide, uranium carbide, and uranium nitride fuels cannot be treated using the melt and dilute process because of their high melting points. What percentage of the material discussed pertains to these elements? **16-36**

The Volume I page 248 discussion of Environmental Consequences did not discuss issues as other EIS's. For example, other DOE reports discuss **"abrupt releases"** that could be part of the risks. **16-37**

Volume I 4.9.1 discusses an assumption of …"sodium-bonded Fast Flux Test Facility driver spent nuclear fuels and **other miscellaneous fuels assumed to be or brought to Idaho." We hope that** your public meetings include all parties and locations. Exactly what are the miscellaneous fuels? No facility wants to process fuels under the title of miscellaneous. This statement is real **vague in terms of worker safety.** **16-38** **16-39** **16-38**

The July SRS draft report on Paths to Closure states on page 84/Public Worker/Environmental hazards and Risks/ **that, "Some declad fuel or fuel with failed cladding can unacceptably degrade current fuel storage facilities. Long-term risk develops from degradation of aluminum** cladding or loss of cooling water followed by atmospheric dispersion of radioactive material. Activities planned to mitigate the risk associated with the stored fuels include: **16-40**

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Response to Commentor No. 16 (Cont'd):

16-21: It is assumed that the commentor is referring to ongoing research being conducted at the University of Missouri's Graduate Center for Materials Research on iron phosphate glass vitrification. This research is funded by DOE and is being conducted in collaboration with the Westinghouse Savannah River Company and Battelle Pacific Northwest National Laboratories. The purpose of this research is to develop a vitrification material for use in the treatment of nuclear waste. It is also worth noting that the University of Missouri's nuclear engineering program has been conducting research for Rockwell International Corporation on the electrochemical processing of spent nuclear oxide fuel. The purpose of this research is to determine if electrochemical processing of spent nuclear fuel could be conducted more economically than the conventional PUREX wet-chemistry process. While similar in nature to the processes evaluated in the EIS, the research being conducted at the University of Missouri does not directly support the treatment and management of sodium-bonded spent nuclear fuel. DOE evaluates new and ongoing treatment technologies on an ongoing basis. While the work at the University of Missouri has not been specifically identified in the EIS, the EIS does address the potential development of new and less mature technologies under the continued storage option of the No Action Alternative.

16-22: Section S.3.3 of the EIS Summary states that the placement of sodium-bonded spent nuclear fuel without decladding or sodium removal is considered as the direct disposal option under the No Action Alternative. The uncertain acceptability of this No Action Alternative is discussed in Section 4.12.1 of the EIS. The placement of declad and cleaned (sodium removed) blanket sodium-bonded spent nuclear fuel in high-integrity cans is considered under Alternative 2, which is described in the EIS Summary, Section S.5.3. The use of the term "may" in the cover page statement reflects the current status of the geologic repository acceptance criteria. These criteria have not been finalized and do not currently address the acceptability of placing spent nuclear fuel containing a chemically reactive material such as sodium within the repository. Until the final waste acceptance criteria are issued, it is uncertain whether spent nuclear fuel containing chemically reactive sodium would be accepted for emplacement in a geologic repository.

16-23: The waste streams can vary between batches. As part of the electrometallurgical demonstration project, waste form characterization testing has been performed on different batches to bound the performance of the waste forms. In the analyses of this EIS, it was conservatively

Commentor No. 16: Patricia McCracken (Cont'd)

Experimental Breeder Reactor II (EBR II) fuel (16.8MTHM0 to be processed in the canyons.Treatment and Storage Facility **(TSF) will be constructed by 2005 for processing aluminum clad fuel (melt and dilute procedure)**. The processed SNF will be packaged for off site shipment. Final Al-clad SNF disposal forms will be less mobile, more manageable, and much more chemically stable; the security risk will be eliminated. It is currently assumed that transfers to the repository will begin in 2015…Stainless Steel and zircally **clad SNF will be transferred to INEEL.**

16-40 (Cont'd)

How does this information correspond with the EIS for availability of storage space?

Has each proposed site worked out the permits from regulators to approve these plans in Federal Facility Agreements? If not some costs would be part of the budgets.

16-41

16-42

How much money was spent to develop any research to solve some of the unanswered questions of the EIS? WE noticed that the electrometallurgical treatment was an experimental demonstration project. What is the name of the report of this project and what is the contract number for reference?

16-43

16-44

On August 16, 1999, we did receive the Cost Study of Alternatives Presented in the Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded spent Nuclear Fuel and a document called Nonproliferation Impacts Assessment for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel. **We received this information only after great effort.**

16-45

The references of **the cost study do not reflect a complete study of costs related to the alternatives.**

Page S-2 of the **cost summary** really sums up the situation very well. Number three states:

Some of the cost estimates underlying Table S-1 are based upon conceptual designs or a partial understanding of the technical requirements for processing the spent nuclear fuel or qualifying the high-level radioactive waste products. These uncertainties are sufficiently large to make it difficult to differentiate between the cost for Alternatives 1 through 3 and Alternatives 4 and 6.

16-46

6

Response to Commentor No. 16 (Cont'd):

assumed that at the time of an accident the process would contain the maximum amount of fission products within each process.

16-24: DOE has assessed, and continues to assess, the performance of waste forms that are potential candidates for disposal in a geologic repository. Waste forms from electrometallurgical treatment, the melt and dilute process, and the Defense Waste Processing Facility are included as part of that assessment.

16-25: ANL-W did not produce any patents during the demonstration project. However, the scientists and engineers who developed the processes used in the demonstration project patented a number of inventions related to the processes and the process equipment. Four patents were issued to cover production of the ceramic waste forms. Four more patents were issued for electrorefiner and electrorefining process inventions related to the demonstration project. The results of the demonstration project were published in a series of reports for DOE and the National Academy of Sciences.

16-26: The chemically reactive nature of metallic sodium is a known property. The products of such reactions are also well known and described in numerous chemistry references. Metallic uranium can react with chemicals and elements in the environment, but the unique chemically reactive feature of the spent nuclear fuel that is the subject of this EIS is its metallic sodium content. Highly enriched uranium raises a criticality concern, but it is not a unique feature of the sodium-bonded spent nuclear fuel considered in this EIS.

16-27: There is uncertainty with regard to the disposal of sodium-bonded spent nuclear fuel at this time since there are no final waste acceptance criteria for a geologic repository. DOE will be developing a final waste acceptance criteria document. The subject of waste acceptance criteria is discussed in EIS Sections 2.7 and 4.12.1. Due to the chemically reactive nature of the metallic sodium present in sodium-bonded spent nuclear fuel, its acceptability as untreated spent nuclear fuel for direct disposal currently cannot be determined. The most current version of DOE's *Waste Acceptance Systems Requirements Document* indicates that acceptable materials destined for the repository shall contain no more than trace quantities of reactive substance. Because of the chemically reactive nature of metallic sodium, it is not likely that sodium-bonded spent nuclear fuel would be acceptable in the proposed geologic respository.

Commentor No. 16: Patricia McCracken (Cont'd)

DOE did not do a complete study of the costs as evidenced by the references in the document. So how did they conduct their environmental assessments and dose studies on such incomplete information? **16-46 (Cont'd) 16-47**

What is really confusing is the statement on S-3 of the cost report that states: " **Costs for disposal of transuranic waste (which are charged incrementally) and costs for disposal of low-level radioactive waste are insignificant." The volume of wastes produced by each process and its disposal costs would seem to be significant.** **16-48**

If you don't have the technology then how do you begin to determine risks or environmental impacts? For example, the furnace needed for a process. **16-47**

The references for cost do not show that the contractor representative called for furnace information, **specifications, or other needed items for all the processes.** **16-49**

DOE has apparently made some agreement with Idaho that amounts to a record of decision outside the statutory regulations of the EIS. That record of decision should have been part of this EIS as a comment. Please provide all the comments in your public documents. Since this EIS is so uncertain as to risks of this waste, we do not understand any agreement that put any type of treatment or time frame for any actions by the DOE.

The idea that DOE has special environmental agreements with some states outside the regulatory NEPA policies is difficult to comprehend. A national policy of determining the Record of Decision is either in the EIS process or in the legal arena of each state. DOE's legal policies vary from state to state. We would guess without seeing the Idaho agreement that DOE did not conduct a full appeal process, thus denying the public complete representation. **It does not seem legal for an EIS to be submitted to a process that has already been determined. This is fooling the public. Unless you really studied this EIS, you would** not have realized that a record of decision was already determined by a DOE agreement. Considering 98% of the waste is in Idaho, this is an important issue. Furthermore, **16-50 16-51**

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Response to Commentor No. 16 (Cont'd):

16-28: The State of Idaho Settlement Agreement and Consent Order is cited in Section 1.1 of the EIS and has been added as Appendix K in the final EIS.

16-29: DOE's global partners have not used sodium-bonded nuclear fuel and have not commented on or been involved with this EIS.

16-30: The SBSNF EIS was prepared in accordance with NEPA, Council on Environmental Quality regulations on implementing NEPA (40 CFR 1500-1508), and DOE's NEPA implementation procedures (10 CFR 1021). None of these require the inclusion of a cost analysis in an EIS. As discussed in the introduction, the basic objective of this EIS is to provide the public and DOE decision-makers with a description of the reasonable alternatives for the treatment and management of DOE's sodium-bonded spent nuclear fuel and their potential environmental impacts. However, DOE has issued a separate Cost Study that analyzes and compares the costs of the alternatives analyzed in the EIS. Cost will be considered during the decision-making process in preparing the Record of Decision.

16-31: SRS was included in the SBSNF EIS preparation process. Technologies planned for or in use at SRS are part of the EIS alternatives analyzed for the treatment and management of sodium-bonded spent nuclear fuel.

16-32: As stated in the EIS, Section 1.1, some EBR-II driver and blanket sodium-bonded spent nuclear fuel assemblies have undergone electrometallurgical treatment under the research and demonstration project that has been underway at ANL-W since 1996. Also, in the 1980s 17 metric tons of heavy metal of EBR-II blanket sodium-bonded spent nuclear fuel were declad and cleaned with the U.S. Nuclear Regulatory Commission approval at the Rocketdyne facilities in California (see Section 2.3.9 in the EIS). The treated spent nuclear fuel was then shipped to SRS for further processing. It is currently stored at SRS in aluminum cans. This spent nuclear fuel is not part of the sodium-bonded spent nuclear fuel considered in this EIS, but is addressed in the Savannah River Site Spent Nuclear Fuel Management EIS.

16-33: Appendix C of the EIS describes all of the alternative treatment processes considered in the EIS. Appendix C also provides information about the maturity and the relative stage of development for each process. Section 2.6 of the EIS identifies all of the alternative treatment technologies that were considered and dismissed from detailed evaluation and the reasons for their dismissal.

Commentor No. 16: Patricia McCracken (Cont'd)

the waste of this EIS is not being presented for the miscellaneous waste by volume or by any other properties. **16-51 (Cont'd)**

You need to be more specific in the terms of the EIS. For example, your glossary states that certain by-product material as defined by Section 11e(2) of the Atomic Energy Act of 1954, as amended. We would expect the contractor to define the waste in this type of scientific terms. **16-52**

This EIS says that we don't know the technology but we know the risks? Just how can that be so? We haven't explained the miscellaneous waste but we know the risks. How can that be so? **16-53** **16-54**

The EIS can't explain most of the technology and they haven't really investigated all the costs, but they know that all these technologies are going to cost this much. How can that be so? **16-55**

If DOE hasn't determined the waste form acceptance criteria then how do you know cost or risk? If you don't know timing of storage for any stage of the process, then how do you determine costs? **16-56**

S-3 of the cost analysis states.."Table S-3 shows the annual costs for each alternative from 2000 to 20006, which represents the majority of the costs of the program. The time table for this chart may be very different if you consider that one process may not be ready. **Readiness of a process could be important for cost. Maybe a chart of** readiness projected timetables would help prioritize your decisions as the agency has already made decisions without the processes to carry out your legal agreements. **16-55**

We believe that DOE and their contractors need to do more **extensive review of these alternatives as these cost figures and risk numbers might change with more investigation.** **16-57**

The cost estimates and references did not show any consultations with electrical engineering persons regarding the voltage issue and risks. A demonstration project and actual operation might need some modifications not in this cost analysis. **16-58** **16-59**

Volume I of the EIS has some very positive language about environmental impacts. How can DOE say that Chaper 4 **16-60**

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Response to Commentor No. 16 (Cont'd):

16-34: The Cost Study was issued during the public comment period, as indicated in Appendix A of the EIS. This report was mailed to interested parties on August 12, 1999, and was made available to attendees at all of the public hearings on the draft EIS

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16-35: DOE is responsible for preparing this comment response document. DOE's contractors assist DOE in this task. After each comment document (e.g., letter, phone call, e-mail) is received from the public, it is read and all the comments identified within it are categorized according to their content. DOE addresses all policy-related and "out of scope" comments, while its contractors answer comments concerning technical and NEPA-related issues. As the responsible agency, DOE reviews and revises the responses to all comments, as appropriate. The completed comment response document is reviewed and approved by DOE. The Government Printing Office is responsible for printing the EIS, including the comment response document.

16-36: As indicated in Section 2.5.7 of the EIS, there are about 0.1 metric tons of heavy metal (0.2 percent) sodium-bonded spent nuclear driver fuel that is composed of uranium oxide, uranium carbide or uranium/plutonium carbide, and uranium nitride that could not be treated using the melt and dilute process. Section C.5 of Appendix C has been revised to reflect the amount of fuel that could not be treated using the melt and dilute process.

16-37: "Abrupt releases" are caused by accidents, the effects of which are analyzed in the EIS. As stated in Section 4.1 of the EIS, the evaluation of human health effects from facility accidents are presented in Appendix F. This appendix explains the methodology used to estimate the human health effects and provides descriptions of various accident scenarios, as well as the associated consequences and risks for each of the alternatives and/or management sites considered.

16-38: Fast Flux Test Facility spent nuclear fuel and other miscellaneous fuel is described in Section 2.2.3 and Appendix D, Section D.5 of the EIS. The discussion of miscellaneous fuel in Section 4.9 has been expanded to reference Appendix D for additional information.

16-39: Public hearings on the SBSNF Draft EIS were held in Idaho Falls, Idaho (August 26, 1999); Boise, Idaho (August 24, 1999); North Augusta, South Carolina (August 17, 1999); and Arlington Virginia (August 31, 1999). These were the same locations in which the public scoping meetings were held earlier in the year. In an effort to ensure that all interested parties were

Commentor No. 16: Patricia McCracken (Cont'd)

provides a "detailed discussion" of the impacts on the potentially affected environmental areas when they don't even know the technology of the furnace or other environmental equipment needed for a process? **16-60 (Cont'd)**

The Environmental Justice issue has not been discussed fully because the EIS does not have the complete pre-decisional report from the DOE legal group working with Idaho. For all we know the material may be deteriating rapidly and need to be moved immediately, or it may be stable until 2035. How did DOE establish the dates in the EIS for action? **16-61** **16-62**

"For the alternatives evaluated, DOE has determined that the proposed action would have minimal or no impacts on the remaining environmental areas (e.g., land resources, visual resources, noise, geology, and soils, ecological resources, and cultural and paleontological resources) at the proposed sites. This is because the proposed facilities already exist so, except for internal building modifications and new equipment installation, no construction activities would be required." **Since the technology is vague, and some of these alternatives indicate construction, how do you say no construction activities? What electrical equipment might be needed?** **16-63**

All of the alternatives did not get a funded demonstration process. **The direct plasma Arc-Vitreous Ceramic process did not have a complete demonstration for filtration and treatment projections.** **16-64**

The computer models and language used in this assessment is not reasonable and nobody can understand what all those terms not in the glossary mean. The EIS states that the "GENII computer model is well documented for assumptions". If the EIS has not clarified the technology then how was the computer programmed to make assumptions on unknowns? How did you calculate dose? How did they figure dose on these demonstration alternatives and on an alternative with no demonstration? **16-65** **16-66**

How did the computer figure finite plume air submersion options, dispersion calculations, and preliminary energy-dependent finite plume dose factors on modified equipment like furnaces with no specifications in the EIS? **16-67**

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Response to Commentor No. 16 (Cont'd):

aware of the public hearings, a Notice of Availability of the draft EIS was published in the Federal Register (64 FR 41404) on July 30, 1999. In addition, the public hearings were advertised in local newspapers and 1,800 post cards were sent to individuals and other interested parties.

16-40: Section 4.12.2 addresses the programmatic schedule considerations associated with alternatives involving SRS and is consistent with the current schedule of SRS activities regarding the treatment of aluminum-clad spent nuclear fuel. This EIS uses consistent assumptions regarding the use and availability of treatment and storage facilities at SRS.

16-41: Federal Facility Agreements are Agreements negotiated between DOE and EPA and/or the appropriate state regulator. These Agreements establish schedules for particular actions (i.e., compliance or cleanup activities), define responsibilities among the parties, and establish a framework for cooperation between parties. These Agreements do not contain provisions for permits. It will be noted that all facilities proposed for the treatment and management of sodium-bonded spent nuclear fuel either have or would acquire the necessary operating permits. Since there will be no substantial increase in waste generated from the treatment of sodium-bonded spent nuclear fuel, no modification to existing permits at storage and disposal facilities is necessary.

16-42: Actual costs for treating and managing the sodium-bonded spent nuclear fuel are not part of the scope of the EIS. The costs associated with obtaining any permits from regulatory agencies outside of DOE were included in the engineering cost estimate assigned to each alternative in the separate Cost Study issued in August 1999.

16-43: Figures on the total cost for the EIS (including the cost of research to address unanswered questions on the EIS) will be available after the EIS is completed and the Record of Decision is published.

16-44: The citation for the environmental assessment on the Electrometallurgical Treatment Research and Demonstration Project is provided below.

Department of Energy, 1996, "Environmental Assessment, Electrometallurgical Treatment Research and Demonstration Project in the Fuel Conditioning Facility at Argonne National Laboratory-West," DOE/EA-1148, Office of Nuclear Energy, Science and Technology, Washington, DC, May 15.

16-45: As stated in Appendix A (Table A-3), DOE committed to provide the public with a Cost Study and a Nonproliferation Impacts Assessment during the

Commentor No. 16: Patricia McCracken (Cont'd)

One alternative needed some "new environmental equipment" just to transport. How was that factored in the computer? How did they figure contamination of filters with no scientific numbers for contamination and no disposal methods? Those conversion models could not have been accurate for radiation dose or anything else. The computer discussion did not give a list of radiation or non-radiation parameters for the reader to know what was programmed for dose.

16-68

E.3.2 Data and General Assumptions…

"To perform the dose assessments for this EIS, different types of data were collected and generated."

This section is all assumptions with no real specifications or specific data. The data cannot be generic as reported.

The statement that worker doses associated with the processing alternatives were determined from historical data associated with similar operations is not appropriate for unknown technology. **The (WSRC 1999) group may have the historical data for the Purex operation but we question the numbers for a modified system. This program is** oversimplified and not site specific enough for worker protection. Some of the sentences don't make sense. What does…"Thus, the only processes considered are those that are credible for the conditions under which the physical system being modeled operates." **The complete specifications for these systems have not been designed so what is this language! " Although the radionuclide** composition of source terms are reasonable estimates, there are uncertainties in the radionuclide inventory and release reactions that affect estimated impacts." These are not reasonable estimates because the data relied too much on estimation. We acknowledge that more data may exist than has been presented in the EIS. The references may just have been omitted.

16-69

We believe your estimated impacts should include more data based on specifications and design numbers.

There was no discussion of the various sites ability to aid **workers or contain accidents (buffer zones) with each alternative. Some of these technologies may be more prone to "abrupt releases" than others.**

16-70

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Response to Commentor No. 16 (Cont'd):

draft EIS public comment period. The Cost Study and the Nonproliferation Impacts Assessment were mailed to interested parties on August 12, 1999, and were made available to attendees at all of the public hearings on the EIS.

16-46: During the decision-making process prior to publishing a Record of Decision, Federal agencies typically do not have detailed design information for proposed actions and alternatives. In fact, Council on Environmental Quality and DOE NEPA regulations discourage proceeding to detailed design before the NEPA process is completed and a Record of Decision is published. Cost estimates for the six alternatives and the No Action Alternative, direct disposal option, are presented in the August 1999 Cost Study and are based largely on conceptual or preliminary design information. However, cost estimates for alternatives utilizing existing spent nuclear fuel treatment facilities and/or processes (e.g., Alternative 1, electrometallurgical treatment at ANL-W and Alternative 3, PUREX at SRS) are more certain than the estimates for alternatives based on less mature technologies. Investing resources to complete detailed designs for each alternative during the NEPA review process would not be cost-effective. DOE believes the Cost Study provides the public with a reasonable comprehensive estimate of the cost of each alternative.

16-47: The EIS was prepared in accordance with Council on Environmental Quality regulations (40 CFR 1500-1508) and DOE's NEPA-related regulations (10 CFR 1021) and procedures. Environmental assessment of a new technology or a modified/enhanced version of an existing technology can be done without a complete and detailed design. In the case of a new technology, a conceptual design was used. The environmental impact analyses consider potential releases that could occur during both normal operations and accident conditions. The estimated releases were based on facility safety analysis reports. For a modified design, the environmental impacts were based on the analysis of the original design and the impacts associated with the modification were added. Both of these evaluations would be performed prior to installation and operation of the equipment. Uncertainties associated with the equipment and operation of a specific technology were captured in the evaluation by making conservative assumptions in the hazard analysis. No technology would go into service until all the requirements of the Federal and state codes and regulations were met.

16-48: The costs of disposing of the transuranic waste and the low-level radioactive waste are only insignificant within the context of the Cost Study. Relative

Commentor No. 16: Patricia McCracken (Cont'd)

The human health evaluation places great emphasis on dose resulting from a release and its chemical form. Yet, this **EIS does not give complete chemical forms for all the alternatives and discusses miscellaneous waste.** 16-71

The use of historical doses is unclear. What time period was used for the computer models on Purex? **Estimates based on similar operations would seem difficult if no other such operations existed.** 16-72

How did you do population doses for air emissions for the melt and dilute with no equipment or filter specifications? 16-73

Some of the basic assumptions like **"Ground Surfaces were assumed to have no previous deposition of radionuclides." How did the computer programmer determine that conclusion?** 16-74

How could you determine **water releases** when the process **would be modified from previous operations?** 16-75

The summary book page S-31 discusses the public and occupational health and safety. "The only risk to the health and safety of the workers and the public under either option of the No Action Alternative would be from **the potential exposure to radiological or hazardous chemical emissions during normal operation or accident conditions."**

The **risks for accidents and hazardous chemical emissions in the EIS appeared to be incomplete for the sources quoted** as references E.6. We didn't even see electrical injuries listed. There was no list to determine the extent of the discussion on all potential health effects by specific chemical and site specific. The volume and changes in liquid effluent discharges would be required for state regulators and facility agreements. Facility agreements were not listed in the references. Legal agreements were not listed in the references. The EPIcode model was not site-specific and the loading of estimates and release rates on unknown parameters may not reflect a complete picture. This model is very exacting in information and not well suited to this EIS. It did not calculate all type of exposures. 16-76

What is the complete list of chemicals that react to sodium to cause adverse impacts? What would be the release 16-77

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Response to Commentor No. 16 (Cont'd):

to the overall cost of the project, these costs contribute less than 1 percent and are insignificant in terms of discriminating between the cost of one alternative versus another.

16-49: Actual costs for treating and managing sodium-bonded spent nuclear fuel are not part of the EIS process. However, the estimates presented in the Cost Study for installing and operating furnaces were based on information from existing furnaces.

16-50: The DOE agreement with Idaho specifies that all spent nuclear fuel will be removed from Idaho by 2035. It does not specify any treatment or management alternatives for sodium-bonded spent nuclear fuel, which is approximately 2 percent of DOE's total DOE spent nuclear fuel inventory. The scope of this EIS is to evaluate and present the environmental impacts of different alternatives, as well as no action, for the treatment of one specific type of spent nuclear fuel in Idaho.

16-51: The term "miscellaneous waste" is not used in this EIS. The commentor may be referring to miscellaneous fuel, which is defined in Section 2.2.3 and Appendix D, Section D.5, of the EIS.

16-52: The definition provided in the glossary for the low-level radioactive waste is based on, and essentially equivalent to, the definition used in the Nuclear Waste Policy Act of 1982, as amended, and given in DOE Order 435.1. As stated in its accompanying manual, "[L]ow-level radioactive waste is defined by what it is not. The definition provides the framework for this concept by listing the basic radioactive waste types that are not low-level waste, thereby limiting the waste that is to be managed as low-level waste."

16-53: The EIS clearly explains the alternative technologies considered for the treatment of sodium-bonded spent nuclear fuel. Discussions of these technologies are provided in Section 2.3 and Appendix C of the EIS. Information regarding the technologies considered in the EIS is sufficient for the purposes of the EIS analysis. As explained in the response to comment 16-47, uncertainties related to equipment and technology are captured in the evaluation of impacts. These uncertainties do not prohibit and/or invalidate the evaluation of environmental impacts and the identification of the potential risks associated with each alternative.

16-54: DOE assumes the comment to be referring to "miscellaneous fuel" and not "miscellaneous waste," as stated. In response to miscellaneous fuel, the EIS has clearly identified the elements of this fuel category in

Commentor No. 16: Patricia McCracken (Cont'd)

rates for each of the substances released? **For example, the EIS mentions wet storage rupture for SRS.**

16-77 (Cont'd)

DOE may need to update its dialogue with proposed sites as persons referenced in the EIS may no longer be in that program. Also DOE contractor persons apparently have changed jobs.

16-78

Thank you for the opportunity to comment.

Response to Commentor No. 16 (Cont'd):

Section 2.2.3 and Appendix D.5, as explained in the response to comment 16-38. This fuel category was considered to be driver spent fuel type, and its risks were evaluated in the EIS.

16-55: The Cost Study was based on an extrapolation of historical costs for comparable operations. The cost for waste form qualification is consistent with other experiences and assumptions within the DOE complex. Uncertainties in the maturity of the technologies are accounted for by the contingency factors used in the Cost Study, with less mature technologies requiring a higher contingency factor. The Cost Study incorporates schedule considerations for each alternative. Estimating the actual costs for treating and managing sodium-bonded spent nuclear fuel is not part of the scope of the EIS.

16-56: As stated in the introduction to the EIS, the programmatic risk in implementing any of the potential alternatives for the treatment and management of sodium-bonded spent nuclear fuel, or of not treating this fuel, is the uncertainty surrounding the acceptability of DOE spent nuclear fuel for placement in a potential geologic repository. Although not final, the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999 (see Section 4.12.1 of the EIS), indicates that it is highly probable that sodium-bonded spent nuclear fuel would not be acceptable in the repository without some stabilization and/or removal of the metallic sodium. The stabilization of the spent nuclear fuel and/or removal of the metallic sodium will provide greater protection of human health and the environment.

16-57: During the decision-making process prior to publishing a Record of Decision, Federal agencies typically do not have detailed design information for proposed actions and alternatives. In fact, Council on Environmental Quality and DOE NEPA regulations discourage proceeding to detailed design before the NEPA process is completed and a Record of Decision is published. Cost estimates for the six alternatives and the No Action Alternative, direct disposal option, are presented in the August 1999 Cost Study and are based largely on conceptual or preliminary design information. However, cost estimates for alternatives utilizing existing spent nuclear fuel treatment facilities and/or processes (e.g., Alternative 1, electrometallurgical treatment at ANL-W and Alternative 3, PUREX at SRS) are more certain than the estimates for alternatives based on less mature technologies. Investing resources to complete detailed designs for each alternative during the NEPA review process would not be cost-effective. DOE believes the Cost Study

provides the public with a reasonable comprehensive estimate of the cost of each alternative.

16-58: A number of electrical engineers and industrial safety engineers were involved in the design, installation, and qualification of the equipment used during the electrometallurgical demonstration project. The costs associated with the demonstration project were used as the basis for estimating the cost of electrometallurgical treatment in the Cost Study. The risks from electrometallurgical treatment related to voltage are small (see response to comment 16-11).

16-59: Such modifications are anticipated. They are taken into account in the Cost Study through contingency factors.

16-60: The uncertainties associated with the development and testing of a new furnace for the melt and dilute treatment process would require a demonstration project that would delay process readiness and implementation. Any technical uncertainties would be resolved before the start of operation. The environmental impacts associated with operation of the furnace, which is an electric induction furnace, for the melt and dilute process were estimated consistent with the methodology described in response to comment 16-47 above.

16-61: It is not clear what predecisional report the commentor is citing. DOE is committed to full compliance with all provisions of Executive Order 12898. The environmental justice analysis was prepared in compliance with the Council on Environmental Quality's guidelines for inclusion of environmental justice under NEPA. The EIS addresses the issue of whether implementation of the proposed action or alternatives would result in disproportionately high and adverse environmental effects on minority populations or low-income populations. The Council's guidance further states that an environmental effect must be significant to qualify as disproportionately high and adverse. The term "significant" is discussed in the Council's implementation regulations (see 40 CFR 1508.27 and Appendix H, Section H.2 of this EIS). As discussed in Chapter 4 of the EIS, implementation of the alternatives for the treatment and management of sodium-bonded spent nuclear fuel would pose no significant radiological or nonradiological health risks to the public. The maximum estimated incremental dose to an average individual from the treatment and management of sodium-bonded spent nuclear fuel would be approximately 0.05 percent of natural background radiation. These risks would not be significant

Commentor No. 16: Patricia McCracken

Response to Commentor No. 16 (Cont'd):

regardless of the racial, ethnic, and economic composition of the potentially affected populations.

16-62: In accordance with DOE's Programmatic Spent Nuclear Fuel EIS, the No Action Alternative for this EIS assumes that each sodium-bonded spent nuclear fuel assembly is examined for integrity (i.e., stabilization activities) before it is placed in storage. Dates in the EIS are based on the availability of facilities and treatment time for each alternative and technology.

16-63: Section 4.1 of the EIS further explains why impacts to land resources, visual resources, noise, geology, soils, ecological resources, and cultural and paleontological resources will not occur. It should be noted that, although some of the technologies are less well developed than others, enough is known about them to indicate that only internal equipment modifications are needed. Current electrical equipment is expected to be adequate to meet project demands.

16-64: Each potential sodium-bonded spent nuclear fuel treatment technology was evaluated based on current knowledge and experience with that technology. The direct plasma arc-vitreous ceramic process was considered in the EIS and, as discussed in Section 2.6 of the EIS, was dismissed for further evaluation. Not all of the technologies analyzed have had a complete demonstration project.

16-65: The SBSNF EIS was prepared in accordance with Council on Environmental Quality regulations (40 CFR 1500-1508) and DOE's NEPA-related regulations (10 CFR 1021) and procedures. The computer codes used in the preparation of this EIS are well documented for assumptions, technical approach, methodology, and quality assurance issues. These codes have been subjected to extensive quality assurance and quality control, including a comparison of the results from the model computations with those from hand calculations and the performance of internal and external peer reviews.

16-66: The GENII computer program that was used to estimate the human health effects from releases of radioactive material during normal operation and accidental conditions is a well-known program, and its applicability has been demonstrated in various DOE EISs. The program models the dispersion of releases and calculates potential doses to the public and individuals residing in the vicinity of the facility. All required input to this program is well defined and the process is well understood. The evaluation is independent of the technology and equipment used. The only input from each process to this program is the quantity of radioactive material released

during normal and accident conditions. As explained in the response to comment 16-47, the releases were estimated based on facility safety analysis reports.

16-67: Atmospheric dispersion of radioactive material releases vary depending on the type and duration of the release. The selection of a dispersion model is an input to the GENII computer program. The dispersion models used in the program are well defined and are explained in the program manual. These models are independent of the technologies used.

16-68: The expression "new environmental equipment" is not used in the EIS and new environmental equipment is not related to the use of a computer program. Contamination in the off-gas system filters originates from the process. Each process is well defined. For example, because of the high temperature used in the melt and dilute process, some radionuclide elements with boiling temperatures below the process temperature would evaporate. Some elements would be oxidized and released to the off-gas system. The gaseous flow through the off-gas system first would be condensed and adsorbed, and then filtered before entering the atmosphere. All noble gases would pass through the filters, but only a small fraction of particulates would pass through filters. The specific assumptions on various filtration factors are given in Appendix E and Appendix F. These appendices also provide the source terms associated with each of the releases considered.

16-69: Appendix E, Section E.3.2, of the EIS provides the data and general assumptions for both generic and site-specific data. Clarifications have been added to each data category to differentiate between the generic and site-specific data. For example, meteorological, population, and source terms data are all site-specific, whereas annual exposure time to plume and ground contaminations are generic data. The estimated worker dose under each alternative is given in Section E.4 of Appendix E. EIS preparers used a standard approach for estimating average and total worker doses that is based on doses received during similar activities within each management facility. The text describing the analysis of uncertainties has been revised for clarification and is applicable to the spent nuclear fuel processed under this EIS.

16-70: Facility and site emergency procedures for accident conditions are included in the operational procedure manual and are documented in the facility Safety Analysis Report. The facility Safety Analysis Report identifies and analyzes the various accident scenarios that could occur during operation and determines their consequences to the public. The operation

Commentor No. 16: Patricia McCracken

Response to Commentor No. 16 (Cont'd):

of a new technology would start only after the facility has met all required regulations, including those that protect the worker and general public. Appendix F of the EIS evaluates a spectrum of accidents that could occur during the treatment process, and also estimates the human health effects associated with each of the accidental radiological and chemical material releases.

16-71: The severity of internal exposure from radiation sources entering the human body through either inhalation or ingestion depends on the chemical form (solubility) of the radioactive material. The analysis in this EIS assumes the worst case solubility scenario, which results in the maximum dose. This is an input parameter to the GENII code. The use of the worst case solubility scenario was added to the list of basic assumptions in Section E.3.2 of Appendix E.

16-72: ANL-W worker doses were estimated based on historical data associated with similar activities. No computer modeling was used to estimate such doses. Similar activities are not necessarily identical activities. For example, electrometallurgical treatment activities include fuel handling activities (i.e, retrieving, dismantling, assembling, transporting) that were performed at ANL-W during experimental breeder reactor operation. Almost all of these activities would occur in a hot cell with remote operation (robotic) tools. Historical dose data on these activities can be used to estimate the worker dose. The average SRS worker dose used to evaluate environmental impacts is routinely assumed to be 500 millirem per year. This dose value is conservative and has been published in numerous EISs. As indicated in Section E.4.3 of Appendix E of this EIS, this average SRS worker dose estimate was used in the SRS Spent Nuclear Fuel Management EIS to estimate the impact of activities similar to those described in this SBSNF EIS.

16-73: It is standard practice to install one or more banks of high-efficiency particulate air filters, known as high efficiency particulate air filters, in the off-gas system. Filter specifications would not be needed to evaluate environmental impacts. Each bank of high efficiency particulate air filters would absorb at least 99.9 percent of the particulates. The use of two banks of filters would reduce the particulate release to the atmosphere by a factor of 1 million from that generated in the process. Only gaseous fission products such as krypton, iodine, and tritium would pass through high efficiency particulate air filters without being absorbed. The iodine gases would be absorbed in charcoal filters installed after the high efficiency particulate air

filters. At least 99 percent of iodine would be absorbed in a bed of charcoal filters. The off-gas system exhaust would enter the facility exhaust system and would pass through another bank of high efficiency particulate air filters. Therefore, a very small fraction (one in a billion) of particulates generated in the melt and dilute process would be released to the environment.

16-74: The analysis in this EIS determined the incremental heath effects associated with the implementation of each alternative. Previously contaminated ground is part of the baseline dose, which is independent of the health effects associated with operation of any one of the treatment processes. Baseline doses to the public at each of the management sites are given in Chapter 3 of the EIS.

16-75: A modification to a process would identify potential changes to a liquid or gaseous effluent. Therefore, for the purposes of environmental impact evaluation, it is known whether a modification would lead to liquid effluent releases.

16-76: For each alternative, the EIS summarizes the risks from releases of hazardous chemicals during both normal operation and accident conditions. Discussions of risk in Chapter 4 are cross-referenced to Appendices E and/or F for further details. For example, under Alternative 1, Section 4.3.4.2 provides the consequences of accidents involving hazardous chemicals in Table 4-17, with a reference to Section F.3.1.2 of Appendix F for details. The chemicals involved in these accidents were uranium and cadmium. Appendix E, Section E.6, lists the references used in that appendix. As indicated, the Savannah River Spent Fuel Management EIS was the source for information about chemical releases during normal operation at SRS. Electrical injuries are considered industrial accidents and are not expected to be affected by any of the alternatives evaluated in this EIS. For example, electrical equipment used in the electrometallurgical treatment process, which has been in operation for over three years, is located in a hot cell (remotely operated); no electrical injuries are expected to result from the remote operation of this equipment. Every operation under the proposed action would be carried out under procedural and operational controls. With regard to permits and regulatory/facility agreements, Chapter 3 of the EIS provides the baseline conditions at each site and lists the applicable standards and/or regulations in each of the resources described. Since there would be no new construction as a result of the proposed action, no regulation and/or standard would be affected. As explained in various sections of Chapter 4 of the EIS, the volume and changes in the effluent discharges would be

Commentor No. 16: Patricia McCracken

Response to Commentor No. 16 (Cont'd):

within the applicable permits and standards. With regards to analysis using the EPIcode™, the only input that was not site- and accident-specific was meteorology. The code does not have the capability to use site meteorology data and is limited to a specific condition (e.g., stability and wind speed). The calculations in this EIS and the applicability of the EPIcode™ and its characteristics are based on a conservative meteorological condition. The applicability of the EPIcode™ and its characteristics are described in Appendix F, Section F.3.1.1. The methodology used to estimate accidental releases of hazardous chemicals also is discussed in Appendix F. In addition, see the responses to comments 16-47, 16-61, and 16-37.

16-77: Openly available chemical references provide details on the nature of chemical reactions with sodium. The release rates for each substance are not relevant to this EIS because the fact that metallic sodium reacts with air and water to produce hydrogen is sufficient to characterize the sodium as chemically reactive and potentially unstable in a geologic repository environment. Current storage conditions for sodium-bonded spent nuclear fuel are monitored. Some sodium-bonded spent nuclear fuel is currently in wet storage at INEEL, not SRS. Some wet storage container leakage has been inferred by the presence of bubbles on the containers, but no dangerous conditions have been found. This EIS does not mention wet storage rupture at SRS.

16-78: DOE Headquarters staff has maintained a dialogue with the site personnel working on the EIS throughout the preparation of the document to ensure that all information is as accurate and up-to-date as possible. Chapter 7 of the EIS accurately reflects the personnel who worked on this EIS.

Commentor No. 17: Steve Hopkins

Notes from Steve Hopkins
8/24/99 - Boise, Idaho

Pyroprocessing raises significant proliferation risks. A National Academy of Sciences (NAS) report commissioned by DOE explained that the process "could be redirected to produce material with nuclear detonation capability." The report also raised questions about interim storage of the waste streams and other aspects of pyroprocessing.

…with some modifications, plutonium could be produced…" James Warf

"Probably the greatest hazard arises from spreading sophisticated technologies around the world, technologies which make reprocessing spent fuel easier and possible in facilities small enough to conceal underground." **17-1**

In 1994, DOE secretary Hazel O'Leary asked Congress to stop funding the IFR. "Because it is based on plutonium reprocessing and recycle, continued development of the Integral Fast Reactor would undercut our efforts to discourage other countries from plutonium reprocessing and recycle."

A DOE source quoted in an industry trade journal (Inside Energy) said that at Argonne-West, pyroprocessing is "just about the only thing they have left to do…It's a jobs issue." Nucleonics Week, June 8, 1995. **17-2**

A 1996 NAS study: "could be used by another country to obtain plutonium for a weapons program."

Another NAS study:
"Although the developers of the electra...technique argue that the technology is proliferation resistant, any SNF processing approach that is capable of separating fissionable materials from associated fission products and transuranic elements could be redirected to produce material with nuclear detonation capability…Demonstration of the process could, however, add to the risk that a nation intent on weapons production might consider adapting this technology for possible production of fissile material, although such material would be of poor quality for a weapon. **17-1**

Response to Commentor No. 17:

17-1: Assessment of nonproliferation impacts is not a part of the scope of the EIS. However, DOE's Office of Arms Control and Nonproliferation assessed the potential nonproliferation impacts that may result from each of the alternatives and technologies analyzed in this EIS. This Nonproliferation Impacts Assessment stated that, for this specific application, electrometallurgical treatment is acceptable in terms of nonproliferation risk.

17-2: ANL-W is involved in other DOE missions in addition to electrometallurgical treatment. Ongoing activities unrelated to electrometallurgical treatment at ANL-W include long-term waste storage gas generation testing at the Zero Physics Power Reactor; characterization and repackaging of mixed hazardous waste for shipment to the Waste Isolation Pilot Project at the Hot Fuel Examination Facility; conversion of sodium coolant from the EBR-II and Fermi reactors to chemically inert low-level radioactive waste in the sodium process facility; and deactivation of the EBR-II facility. The number of jobs affected by the electrometallurgical treatment alternative at ANL-W is presented in Section 4.2.3 of the EIS.

Commentor No. 18: Anonymous

Draft EIS Comment Form

Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

I SUPPORT THE PLAN AS OUTLINED. THIS SHOULD BE DONE AT ANL-W Electrometallurgical Treatment plan

18-1

There are several ways to provide comments on the Draft EIS for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel and these include:

- attending public hearings and giving your comments directly to DOE representatives
- returning this comment form to the registration desk at a public hearing or to the address listed below
- calling toll-free and leaving your comments: 1-877-450-6904
- faxing your comments toll-free to: 1-877-621-8288
- commenting via e-mail: sodium.fuel.eis@hq.doe.gov

Name (optional): _____

Organization: _____

Home/Organization Address (circle one): _____

City: _____ State: ____ Zip Code: _____

Telephone (optional): _____

COMMENTS MUST BE POSTMARKED BY SEPTEMBER 13, 1999

For more information contact: Susan Lesica, NE-40
U.S. Department of Energy • 19901 Germantown Road • Germantown, MD 20874
Toll-free Telephone: 1-877-450-6904 • Toll-free Fax: 1-877-621-8288
E-mail: sodium.fuel.eis@hq.doe.gov • Website: http://www.ne.doe.gov/home/eis.html

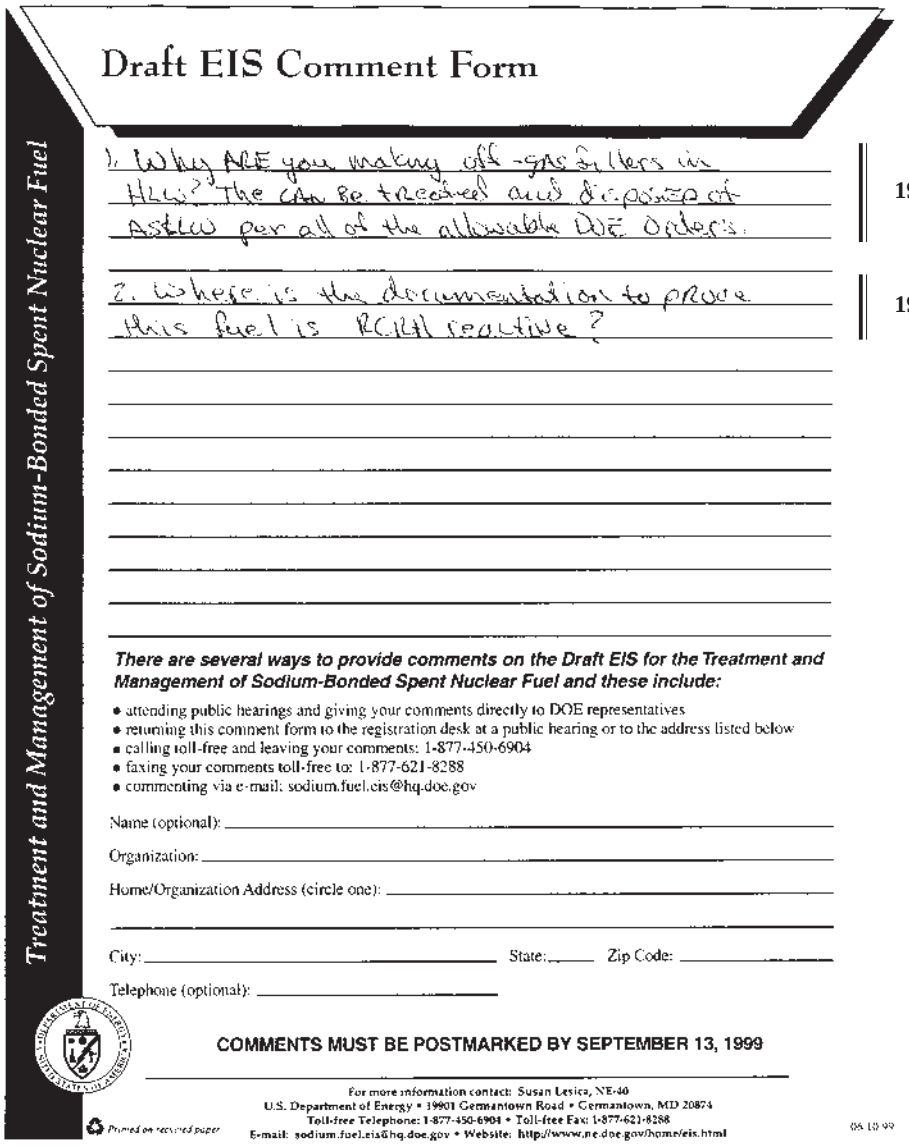
Printed on recycled paper

06-10-99

Response to Commentor No. 18:

18-1: The commentor's support for the electrometallurgical treatment of sodium-bonded spent nuclear fuel at ANL-W is noted.

Commentor No. 19: Anonymous



Draft EIS Comment Form

Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

1. Why ARE you making off-gas filters in HLW? The can be treated and disposed of as LLW per all of the allowable DOE Orders.

19-1

2. Where is the documentation to prove this fuel is RCRA reactive?

19-2

There are several ways to provide comments on the Draft EIS for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel and these include:

- attending public hearings and giving your comments directly to DOE representatives
- returning this comment form to the registration desk at a public hearing or to the address listed below
- calling toll-free and leaving your comments: 1-877-450-6904
- faxing your comments toll-free to: 1-877-621-8288
- commenting via e-mail: sodium.fuel.eis@hq.doe.gov

Name (optional): _____

Organization: _____

Home/Organization Address (circle one): _____

City: _____ State: ____ Zip Code: _____

Telephone (optional): _____

COMMENTS MUST BE POSTMARKED BY SEPTEMBER 13, 1999

For more information contact: Susan Lesica, NE-40
U.S. Department of Energy • 19901 Germantown Road • Germantown, MD 20874
Toll-free Telephone: 1-877-450-6904 • Toll-free Fax: 1-877-621-8288
E-mail: sodium.fuel.eis@hq.doe.gov • Website: http://www.ne.doe.gov/home/eis.html

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05-13-99

Response to Commentor No. 19:

19-1: The off-gas system in the melt and dilute process would capture various nuclides such as cesium, tellurium, and iodine that have boiling points below up to 1,400 °C (2,250 °F) and would be vaporized during the heating and melting process. The vaporized nuclides would be condensed and absorbed. In addition, the process would generate small quantities of oxidized actinides (e.g., plutonium, americium) that also would be captured in the filters. Depending on the level of contamination of the filters, they will be disposed of as either low-level or high-level radioactive waste. As indicated in Section 4.7.6 of the EIS, these filters would be periodically cleaned and decontaminated. The decontamination of the filters and the absorbent used to collect the volatile nuclides would produce high-level radioactive waste to be disposed of in a DOE standardized canister.

19-2: Metallic sodium reacts vigorously with water or moist air to produce heat, potentially explosive hydrogen gas, and sodium hydroxide, a corrosive substance. One of the primary goals of RCRA is to ensure that waste is managed in an environmentally sound manner. As discussed in Section 4.12.1 of the EIS, untreated sodium-bonded spent nuclear fuel may be regulated by RCRA, since it exhibits certain characteristics considered hazardous; that is, it is ignitable as defined in 40 CFR 261.21, corrosive as defined in 40 CFR 261.22, and reactive as defined in 40 CFR 261.23. However, this determination has not been made. Thus, the presence of metallic sodium could complicate qualification of this spent nuclear fuel for ultimate disposal in a geologic repository.

Commentor No. 20: Beth Duke

Forward Header

Subject: Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel
Author: beth@sunvalleymag.com at_INTERNET
Date: 8/23/99 11:34 AM

August 22, 1999

As a citizen of the United States, and a resident of Idaho, I would like to make the following comments on the Draft Environmental Impact Statement for the Treatment and Management of Sodium Bonded-Spent Nuclear Fuel.

First, I would ask that you extend the public comment period at least 60 days, since much information that is relevant to the procedure will not be available until after the current comment period is closed. For the public to be able to accurately access this draft EIS, and to make accurate comments, this is the very least the Department of Energy should do. **20-1** **20-2**

Secondly, I would like to go on record as objecting to pyroprocessing by the INEEL for the following reasons: **20-3**

1. The entire concept runs counter to the US nonproliferation goals since it separates out bomb-grade uranium from spent fuel and the technology can be modified to separate out bomb-grade plutonium. **20-4**

2. Take taxpayer dollars away from greater environmental problems at the INEEL. **20-5**

3. Creates new forms of nuclear waste. **20-6**

4. Wastes taxpayer dollars (as emphasized on NBC's "Bleeding of America). **20-5**

Thank you,

Beth M. Duke
PO Box 964
Sun Valley, Idaho 83353
788-0770 (work)

Response to Commentor No. 20:

20-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

20-2: DOE made materials supporting preparation of the EIS available in the public reading rooms and at the public hearings held on August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho; and August 31, 1999, in Arlington, Virginia. These materials included the environmental assessment for the Electrometallurgical Treatment Research and Demonstration Project, the Finding of No Significant Impact for the environmental assessment, National Research Council reports, the 1995 Settlement Agreement and Consent Order with the State of Idaho, scoping period meeting transcripts and comments, and the draft EIS hearing presentations and fact sheets. In addition, completion of the Cost Study and Nonproliferation Impacts Assessment was expedited so that they also would be available to the public during the comment period. These reports were mailed to interested parties on August 12, 1999, and were available at the public hearings on the draft EIS. Although these reports are not critical to the environmental impact analysis presented in the EIS, they will be considered during the decision-making process in the preparation of the Record of Decision. While the final National Research Council report on the Electrometallurgical Treatment Research and Demonstration Project at ANL-W was published April 2000, interim status reports were produced throughout the project. Data generated during the demonstration project were used in preparing the EIS, as discussed in Section 1.6.3 of the EIS.

20-3: The commentor's objection to electrometallurgical treatment (pyroprocessing) of sodium-bonded spent nuclear fuel at INEEL is noted.

20-4: The assessment of nonproliferation impacts is not a part of the EIS process. The Nonproliferation Impacts Assessment stated that electrometallurgical treatment, for this specific application, would not result in an increase in weapons-usable fissile material inventories. Although highly enriched uranium would be an interim product of electrometallurgical treatment, it would be downblended to low-enriched uranium during treatment. Within the current equipment configuration and design, it is not possible to produce weapons-usable plutonium by adjusting operating parameters. Traditional aqueous processing would have to be used after electrometallurgical treatment. However, traditional aqueous processing could also be used to produce weapons-usable plutonium directly from the spent nuclear fuel, without electrometallurgical treatment.

Commentor No. 20: Beth Duke

Response to Commentor No. 20 (Cont'd):

20-5: Congress determines how funds are allocated. DOE spends monies consistent with Congressional direction. DOE is not in a position to make the difficult tradeoffs that may be required between alternative Federal programs and spending priorities. The issue of funding for the treatment and management of sodium-bonded spent nuclear fuel is beyond the scope of the SBSNF EIS.

20-6: All of the alternatives evaluated in this EIS would produce some forms of high-level radioactive waste. Electrometallurgical treatment (or pyroprocessing) would produce two new waste forms, both of which are more stable than untreated sodium-bonded spent nuclear fuel. DOE expects that these waste forms would be suitable for disposal in a geologic repository.

Commentor No. 21: Bpdufur@micron.net

Forward Header

Subject: Draft Environmental Impact Statement of the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel
Author: bpdufur@micron.net_At_INTERNET
Date: 8/25/99 9:33 PM

I am commenting on the Draft Environmental Impact Statement of the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel.

Please extend the comment period for the above subject. The study done by the National Academy of Sciences of the proposed treatment needs to be honestly reviewed. **21-1** **21-2**

Response to Commentor No. 21:

21-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

21-2: The National Academy of Sciences' National Research Council prepared interim status reports on the results of the Electrometallurgical Treatment Research and Demonstration Project that have been reviewed by DOE. The National Research Council completed their evaluation of the electrometallurgical treatment demonstration project in September 1999 and published their final summary report in April 2000. The final report findings will be considered during the decision-making process leading to the Record of Decision.

Commentor No. 22: Doug Turner

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_____Forward Header_____
Subject:    Fwd:Comments on Draft EIS for Na Bonded SNF
Author:     <EMTEIS@hq.doe.gov>
Date:       9/16/99 8:32 AM


_____Forward Header_____
Subject:    Comments on Draft EIS for Na Bonded SNF
Author:     dwz@ornl.gov at INTERNET
Date:       9/15/99 11:47 AM

Comments on the Draft Environmental Impact Statement for the
Treatment and Management of Sodium-Bonded Spent Nuclear Fuel
Section S.2 of the EIS describes the types of sodium bonded fuel
in the DOE inventory in terms of five distinct categories:  EBR-II
Driver, EBR-II Blanket, Fermi-1 Blanket, Fast Flux Test Facility
Driver, and Miscellaneous.  The Miscellaneous category includes
small lots of sodium bonded SNF at various sites (Hanford, Oak
Ridge, Savanah River, and Sandia) which are to be shipped to INEEL
per the record of decision on the PEIS for SNF.   However, section
S.5 of the EIS describes the six evaluated alternatives (which are
combinations of No Action, Electrometallurgical Treatment at ANL-W,
PUREX at SRS, and Melt & Dilute at SRS or ANL-W) solely in terms of
application for either blanket fuel or driver fuel categories.

There is no mention of the Miscellaneous category in the evaluated
alternatives.  If this EIS is intended to address the disposition
of the Miscellaneous sodium bonded SNF category, the relationship
between the Miscellaneous category and the driver and blanket fuel
disposition alternatives should be explicitly stated.


If there are any questions about these comments, please contact
either me or Brian Oakley at 423-241-3061.

Doug Turner
Bechtel Jacobs Company LLC
7078F, MS 6402
ph 423-576-2017; fax 423-241-5049
pager 873-5378; dwz@ornl.gov
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22-1

Response to Commentor No. 22:

22-1: The miscellaneous sodium-bonded spent nuclear fuel is described in Appendix D, Section D.5. For the purposes of this EIS, all miscellaneous sodium-bonded spent nuclear fuel is considered to be driver fuel. Section 2.2.3 of the EIS has been revised to provide this clarification.

Commentor No. 23: Matt Smith

From: msmith@computer-depot.com_at_INTERNET at X400PO
Date: 8/22/99 11:12AM -0700
To: EMTEIS at NE-02
Cc: SSmith7235@aol.com_at_INTERNET at X400PO
Subject: Pyroprossing

I am writing you in regard to the proposed Pyroprocessing program At INEEL.

There must be a 60 day extension of the comment period in order to adequately address all the concerns. **23-1**

It appears the DOE is missing **23-2**

1. The demonstration project results on pyroprocessing. **23-3**
2. A National Academy of Sciences review of the project. **23-4**
3. Cost analysis of the various alternatives. **23-5**
4. A nuclear weapons proliferation assessment by the Department of Energy. **23-6**
5. Yucca Mountain, the purported destination of the waste, has not done a detailed environmental impact study on accepting the waste. The history to date indicates that neither Yucca Mountain or WIPP will accept this type of waste.

Once again Idaho with a volatile record of earth quakes in this area and an acquifer that is world renown will be forced to hold indefinitely this dangerous material along with our breath in the hopes that the predictions of future eruptions will not occur. This is highly unacceptable with no more assurances and concrete Evidence that we have at the present time that we are not at risk. **23-7**

Yours truly,

Matt Smith

Response to Commentor No. 23:

23-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

23-2: The Electrometallurgical Treatment Research and Demonstration Project began in June 1996 and, although the test results have not yet been finalized in a single report, a number of status reports issued by the National Academy of Sciences' National Research Council Committee were considered in the preparation of the draft EIS. The success criteria established at the outset of the project were fulfilled. The environmental impact analysis associated with the electrometallurgical treatment process alternatives was based on actual data from the project. Section 1.6.3 of the EIS summarizes the status and the results of the demonstration project.

23-3: The National Academy of Sciences' National Research Council prepared interim status reports on the results of the Electrometallurgical Treatment Research and Demonstration Project that have been reviewed by DOE. The National Research Council completed their evaluation of the electrometallurgical treatment demonstration project in September 1999 and published their final summary report in April 2000. The final report findings will be considered during the decision-making process leading to the Record of Decision.

23-4: The SBSNF EIS was prepared in accordance with NEPA, Council on Environmental Quality regulations on implementing NEPA (40 CFR 1500-1508), and DOE's NEPA implementation procedures (10 CFR 1021). None of these require the inclusion of a cost analysis in an EIS. As discussed in the introduction, the basic objective of this EIS is to provide the public and DOE decision-makers with a description of the reasonable alternatives for the treatment and management of DOE's sodium-bonded spent nuclear fuel and their potential environmental impacts. However, DOE issued a separate Cost Study on August 12, 1999, that analyzes and compares the costs of the alternatives analyzed in the EIS. Cost will be considered during the decision-making process in preparing the Record of Decision.

23-5: Although the assessment of nonproliferation impacts is not a part of the EIS process, DOE's Nonproliferation Impacts Assessment was mailed out to interested members of the public on August 12, 1999, and is available by request. The assessment was also placed in the DOE public reading rooms and distributed at the public hearings held during the public comment period on the draft EIS. Information from the assessment, along with other factors such as costs, schedules, environmental consequences, and technical

risk will be considered during the decision-making process leading to the Record of Decision.

23-6: This SBSNF EIS does not specify a site for an ultimate geologic repository. Only preliminary waste acceptance criteria currently exist. Conclusions regarding the acceptability of the different waste forms for each alternative are addressed in the EIS. As discussed in Section 1.6.2.2 of this EIS, the Yucca Mountain Draft EIS has been issued by DOE. The draft waste acceptance criteria for Yucca Mountain currently only address defense waste processing facility high-level waste logs and commercial spent nuclear fuel as acceptable. DOE expects that the waste products described for all the alternatives analyzed in detail in the SBSNF EIS will be acceptable in the final waste acceptance criteria for Yucca Mountain.

23-7: As a result of its agreement with the State of Idaho, DOE is developing a treatment process to facilitate the disposal of the sodium-bonded spent nuclear fuel. Under this agreement, all spent nuclear fuel will be moved out of Idaho by the year 2035. The alternatives analyzed in this EIS treat the sodium-bonded nuclear fuel and create waste forms that would most likely be acceptable for disposition in a geologic repository. As described in Chapter 4 of this EIS, under all alternatives no radiological liquid effluent would be discharged to the groundwater or the aquifer at the INEEL site. Evaluations of the radiological impacts associated with an earthquake have shown the risk of latent cancer fatalities to a member of the public residing within 80 kilometers (50 miles) of the site to be much lower than 1. Therefore, as a result of the proposed action, no measurable increase in the number of latent cancer fatalities in the surrounding population is expected for a postulated earthquake in the INEEL area.

Commentor No. 24: Monte Wilson

TO: Susan Lesica, USDOE
FROM: Monte D. Wilson, 1055 Dobyns Lane, Potlatch, ID 83855
DATE: August 29, 1999
RE: Comments on the Draft EIS for Treatment and Management of Sodium-Bonded SNF

Inasmuch as the draft EIS places primary emphasis on Electrometallurgical technology, I request that the comment period be extended until: **24-1**

a) the electrometallurgical treatment demonstration project has been completed and thoroughly evaluated, and b)the National Academy of Sciences completes its review of the electrometallurgical treatment process. **24-2** **24-3**

I recommend that the two separation technologies under consideration (EMT and PUREX) be rejected because they would be in conflict with US nonproliferation goals and because they would produce multiple, and new waste forms. **24-4** **24-5**

I recommend that a non-separation technology be used for Treatment of all sodium-bonded spent nuclear fuel.

I recommend that the High Integrity Cans be used for disposal of The blanket fuel.

I recommend that further development work be done to determine if it is feasible to remove sodium from the driver fuel and then dispose of the driver fuel in High Integrity Cans. If the process is feasible, I recommend that it be utilized for disposal of all driver fuel. **24-6**

If the sodium removal and disposal in High Integrity Cans is Ultimately shown to be not feasible for the driver fuel, then I recommend that it be prepared for disposal by some other non-separation technology such as the Glass Material Oxidation and Dissolution System (GMODS) or the Direct Plasma Arc-Vitreous Ceramic Treatment process. **24-7**

Response to Commentor No. 24 :

24-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

24-2: The draft EIS did not emphasize the electrometallurgical treatment technology over the other process technologies. The Electrometallurgical Treatment Research and Demonstration Project began in June 1996 and, although the test results have not been finalized in a single report, a number of status reports issued by the National Academy of Sciences' National Research Council Committee were considered in the preparation of the draft EIS. The success criteria established at the outset of the project were fulfilled. The environmental impact analysis associated with the electrometallurgical process alternatives was based on actual data from the project. Section 1.6.3 of the EIS summarizes the status and the results of the project.

24-3: The National Academy of Sciences' National Research Council prepared interim status reports on the results of the Electrometallurgical Treatment Research and Demonstration Project that have been reviewed by DOE. The National Research Council completed their evaluation of the electrometallurgical treatment demonstration project in September 1999 and published their final summary report in April 2000. The final report findings will be considered during the decision-making process leading to the Record of Decision.

24-4: The commentor's opposition to electrometallurgical treatment and PUREX is noted. DOE is concerned with the nonproliferation impacts of all its proposed actions, although the assessment of nonproliferation impacts is not a part of the EIS process. For this reason a separate Nonproliferation Impacts Assessment was prepared by DOE's Office of Arms Control and Nonproliferation. This assessment stated that, for this specific application, all alternatives except PUREX processing at SRS are fully consistent with U.S. policy concerning reprocessing and nonproliferation. Information from this assessment, along with factors such as costs, schedules, environmental consequences, and technical risk will factor into the Record of Decision for the treatment and management of sodium-bonded spent nuclear fuel.

24-5: The high-level radioactive waste form resulting from PUREX process is borosilicate glass, which has already been extensively tested and analyzed under conditions relevant to a geologic repository. The ceramic and metallic waste forms generated during the electrometallurgical treatment process represent chemically stable materials compared to untreated sodium-bonded

Commentor No. 24: Monte Wilson

Response to Commentor No. 24 (Cont'd):

spent nuclear fuel. The production of a chemically stable waste form to replace a chemically reactive waste form (i.e., sodium-bonded spent nuclear fuel) represents an improvement in the safe, long-term storage of this spent nuclear fuel. DOE expects the new waste forms resulting from the electrometallurgical treatment process will be suitable for disposal in a repository and will meet the requirements of the final waste acceptance criteria.

24-6: The commentor's recommendation of a nonseparation technology is noted. Also noted is the commentor's recommendation for packaging cleaned blanket sodium-bonded spent nuclear fuel in high-integrity cans. At the present time the complete removal of metallic sodium from driver sodium-bonded spent nuclear fuel is not feasible. However, the commentor's recommendation for further development leading to the removal of sodium from driver spent nuclear fuel is noted.

24-7: The commentor's preference for a nonseparation technology to treat sodium-bonded spent nuclear fuel is noted. In addition to the GMODS and direct plasma arc-vitreous ceramic treatment processes, which are considered and dismissed from evaluation in this EIS as less mature technologies, the melt and dilute treatment process is another nonseparation technology. The melt and dilute treatment process is analyzed in this EIS and is being considered for treating driver and blanket fuel at ANL-W and blanket fuel at SRS.

Commentor No. 25: Nancy Fenn

Date: 8/30/99 2:03 PM
Priority: Normal
Subject: Fwd(2):STOP THE MADNESS!

I am commenting on the Draft Environmental Impact Statement for
The Treatment and Management of Sodium-Bonded Spent Nuclear Fuel.

Please stop nuclear weapons work in Idaho! The proposed project at **25-1**
the INEEL creates new forms of waste, creates nuclear bomb **25-2**
ingredients which runs counter to US nonproliferation goals, and **25-3**
takes valuable money away from greater environmental problems at **25-4**
INEEL. Not to mention that it is a waste of taxpayer dollars.

Please grant an extension of the comment period of at least 60 **25-5**
days. This extension should be granted because the DOE is missing
the following:
a) the demonstration project results on pyroprocessing **25-6**
b) National Academy of Sciences review of the proposed treatment **25-7**
c) cost analysis of the various alternatives **25-8**
d) nuclear weapons proliferation assessment by the Department of **25-9**
Energy
e) Yucca Mountain Environmental Impact Statement-the waste **25-10**
acceptance criteria are not known.

Please, come to your senses before this century ends and do the **25-11**
right thing for Idaho and this country. If nothing else, grant the **25-5**
extension so that you have all relevent information before you make **25-11**
a decision. This country is too great to destroy.

Sincerely,
Nancy W. Fenn

Response to Commentor No. 25:

25-1: As stated in Section 1.1 of the EIS, the proposed action of this EIS is to treat and manage sodium-bonded spent nuclear fuel and facilitate its ultimate disposal in a geologic repository, not to perform nuclear weapons work in Idaho.

25-2: All of the alternatives evaluated in this EIS would produce some forms of high-level radioactive waste. Electrometallurgical treatment (or pyroprocessing) would produce two new waste forms, both of which are more stable than untreated sodium-bonded spent nuclear fuel. DOE expects that these waste forms would be suitable for disposal in a geologic repository.

25-3: The assessment of nonproliferation impacts is not a part of the EIS process. None of the alternatives analyzed in this EIS would generate weapons-usable fissile materials at INEEL. Although highly enriched uranium would be an interim product, it would be downblended to low-enriched uranium during electrometallurgical treatment.

25-4: Congress determines how funds are allocated. DOE spends monies consistent with Congressional direction. DOE is not in a position to make the difficult tradeoffs that may be required between alternative Federal programs and spending priorities. The issue of funding for the treatment and management of sodium-bonded spent nuclear fuel is beyond the scope of the SBSNF EIS.

25-5: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

25-6: The Electrometallurgical Treatment Research and Demonstration Project began in June 1996 and, although the test results have not been finalized in a single report, a number of status reports issued by the National Academy of Sciences' National Research Council Committee were considered in the preparation of the draft EIS. Success criteria established at the outset of the project have been fulfilled. The environmental impact analysis associated with the electrometallurgical process alternatives was based on actual data from the project. Section 1.6.3 of the EIS summarizes the status and the results of the project.

25-7: The National Academy of Sciences' National Research Council prepared interim status reports on the results of the Electrometallurgical Treatment Research and Demonstration Project that have been reviewed by DOE. The National Research Council completed their evaluation of the

Commentor No. 25: Nancy Fenn

Response to Commentor No. 25 (Cont'd):

electrometallurgical treatment demonstration project in September 1999 and published their final summary report in April 2000. The final report findings will be considered during the decision-making process leading to the Record of Decision.

25-8: The SBSNF EIS was prepared in accordance with NEPA, Council on Environmental Quality regulations on implementing NEPA (40 CFR 1500-1508), and DOE's NEPA implementation procedures (10 CFR 1021). None of these require the inclusion of a cost analysis in an EIS. As discussed in the introduction, the basic objective of this EIS is to provide the public and DOE decision-makers with a description of the reasonable alternatives for the treatment and management of DOE's sodium-bonded spent nuclear fuel and their potential environmental impacts. However, DOE issued a separate Cost Study on August 12, 1999, that analyzes and compares the costs of the alternatives analyzed in the EIS. Cost will be considered during the decision-making process in preparing the Record of Decision.

25-9: Although the assessment of nonproliferation impacts is not a part of the scope of the EIS, DOE's Nonproliferation Impacts Assessment was mailed out to interested members of the public on August 12, 1999, and is available by request. The assessment was also placed in the DOE public reading rooms and distributed at the public hearings held during the public comment period on the draft EIS. Information from the assessment, along with other factors such as costs, schedules, environmental consequences, and technical risk will be considered during the decision-making process leading to the Record of Decision.

25-10: No final waste acceptance criteria for a geologic repository have been established at this time. DOE expects that the waste forms described in this EIS will be acceptable. The Draft Yucca Mountain EIS was issued in July 1999 and is discussed in Section 1.6.2.2 of this EIS.

25-11: The scope of this EIS encompasses a comprehensive evaluation of the environmental impacts of alternatives for the treatment and management of sodium-bonded spent nuclear fuel. This EIS indicates that the environmental impacts of using any of the alternatives to treat and manage sodium-bonded spent nuclear fuel are very small. The removal of chemically reactive sodium creates a safer product for disposal in a repository, thus reducing risks to the environment.

Commentor No. 26: John Tanner

Testimony August 26, 1999

The treatment of the driver portion of the sodium-bonded nuclear fuel by the electro-metallurgical process is the most sensible option proposed, for the following reasons.

It would allow recovery and use of the high-enriched uranium, which is valuable material that was costly to produce.

This fuel is not suitable for the PUREX process at Savannah River Laboratory because the sodium cannot be completely removed from this fuel by any reasonable process.

26-1

The other methods--melt and dilute, chloride volatility, plasma arc ceramic process, and the glass material process (GMODS)--are less well developed, are likely to be more expensive even after development, and involve heating the fuel to high temperatures, which will worry some people about whether the volatile elements would pollute the air.

The plutonium in the blanket fuel is valuable and should be recovered.

If this were done by the PUREX process, the recovered plutonium would be pure enough to be made into mixed oxide fuel to generate electricity in commercial power reactors. Much of the development of this process is already contemplated for plutonium recovered from weapons. The costs of decladding, sodium removal, and shipment from Idaho would need to be considered.

26-2

The plutonium could also be recovered by the electrometallurgical process. Why is this not mentioned as an alternative in the DEIS? This is as reasonable as many of the other alternatives presented. Although the recovered plutonium would be too contaminated with other transuranic elements to be useful as MOX fuel, it would be useful in a future fast neutron reactor, such as the one which produced it.

But to answer the question just raised, recovery of plutonium by the electrometallurgical process was omitted in order to please influential anti-nuclear critics, who raise weapons proliferation concerns, ignoring the fact that the electrometallurgical process is far more proliferation resistant than the well known PUREX process. The demonstration of plutonium separation by the electrometallurgical process would do nothing to aid anyone's ability to obtain weapons usable material.

However, putting this plutonium in the waste, as proposed for most of the alternatives in the DEIS, will only temporarily please these critics. When it is later proposed to bury this waste, whether in Yucca Mountain or elsewhere, they will again object, pointing to plutonium's long half-life, and to recent evidence that trace amounts of plutonium can migrate in ground water under special, artificial conditions. Note that the critics have been vehemently opposing the transport and burial of waste with only trace amounts of plutonium in the WIPP. What will they say when it is proposed to bury waste with substantial amounts of plutonium?

26-3

Any method of dealing with plutonium will be criticized, therefore we should do the sensible thing and recover it for later use.

26-2

John Tanner
529-5605

Response to Commentor No. 26:

26-1: The commentor's support for electrometallurgical treatment of driver sodium-bonded spent nuclear is noted. The EIS discusses all of the commentor's concerns. Separate studies consider the nonproliferation characteristics of the various alternative technologies and the costs associated with each of the alternatives. The EIS assessment and the conclusions presented in the separate studies will provide some of the information that will be considered during DOE's decision-making process, the results of which will be published in the Record of Decision.

26-2: The commentor's remarks about the value of plutonium present in the sodium-bonded spent nuclear fuel are noted. The intent of this EIS, as discussed in Section 1.2, is to resolve issues associated with the sodium content of sodium-bonded spent nuclear fuel. The disposition of the fissile material content of the fuel is not within the scope of the EIS and is not considered an issue in the formulation of the reasonable alternatives. It is, however, an important consideration in the Nonproliferation Impacts Assessment of the alternatives that was prepared separately from the EIS. The conclusions of the Nonproliferation Impacts Assessment, along with those of the EIS, will be considered during the decision-making process leading to the Record of Decision.

26-3: DOE, consistent with U.S. nuclear nonproliferation policy, would not separate plutonium except for the PUREX process. DOE expects that the plutonium-containing waste from the electrometallurgical treatment process would be acceptable in a geologic repository for the same reasons that plutonium-containing commercial spent nuclear fuel is already acceptable.

Commentor No. 27: John Commander

ELECTROMETALLURGICAL EIS TALKING POINTS FOR AUGUST 26 1999

O I support the treatment of sodium-bonded spent nuclear fuel by the electrometallurgical process. The process should be used for all such fuel. as described in alternative 1 of the Draft Environmental Impact Statement. **27-1**

O The electrometallurgical treatment has been proven to be satisfactory. Many of the other alternatives are in the concept or research stage.

O Nearly all the sodium-bonded fuel is now at ANL-West. It makes both common and economic sense to do the entire treatment there. **27-2**

O I am concerned about the loss of jobs and skills, if the treatment is not at ANL-W. These skills are particularly important at this time. The current administration is finally putting some new funding into nuclear research and technology. DOE has designated INEEL as the lead laboratory for this effort. **27-3**

O The electrometallurgical treatment has little risk that nuclear material could be diverted to use in nuclear bombs. The Draft EIS has adequately answered the comments of those concerned about that risk. **27-4**

O Whatever alternative is chosen, it must meet the terms of the 1995 Governor's Agreement on Nuclear Waste. If treatment is done at Savannah River, material must be moved there before the Year 2035. This date is the deadline for all spent fuel to be out of Idaho. **27-5**

Submitted by:

John Commander

Member: IAWS & INEL Retired Employee Association

Telephone (208) 523 5738

Response to Commentor No. 27:

27-1: The commentor's support for the electrometallurgical treatment of both driver and blanket sodium-bonded spent nuclear fuel (Alternative 1) is noted.

27-2: The commentor's support for treatment of all sodium-bonded spent nuclear fuel at ANL-W is noted. The cost implications compared to other alternatives are evaluated in a separate Cost Study.

27-3: The commentor's concern about the loss of jobs and skills if treatment of sodium-bonded spent nuclear fuel is not conducted at ANL-W is noted. DOE recognizes the value and the presence of important skills at ANL-W and INEEL. As part of the decision-making process, DOE will consider the consequences of potential impacts to various environmental resources, including socioeconomics. The Record of Decision will explain the rationale and factors for DOE's decision.

27-4: The commentor is correct. Under this specific application, electrometallurgical treatment of sodium-bonded spent nuclear fuel would not produce weapons-usable material, thereby reducing the risk that this spent nuclear fuel might be diverted for other uses.

27-5: The terms of the State of Idaho Settlement Agreement and Consent Order (Governor's Agreement) are accounted for in all of the alternatives evaluated in this EIS. A copy of the agreement is provided in Appendix K.

Commentor No. 28: Terry & Theresa Williams

Terry & Theresa Williams
P. O. Box 1627
Hailey, ID 83333

August 25, 1999

Ms. Susan Lesica
U.S. Department of Energy
Office of Nuclear Facilities Management, NE-40
19901 Germantown Road
Germantown, Maryland 20874-1290

Dear Ms. Lesica:

We are writing to register our comments on the "Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel."

We request that you extend the comment period past September 13, 1999 by at least 60 days since much of the information relevant to the procedure won't be available until after the comment period is closed. **28-1**

In closing, we would like to add that we are against Pyroprocessing. **28-2**

Thank you very much for registering our comments.

Terry & Theresa Williams

Response to Commentor No. 28:

28-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169). DOE made materials relevant to the review of the draft EIS available in public reading rooms and at a series of public hearings that were held on August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho; and August 31, 1999, in Arlington, Virginia. The materials placed in the reading rooms included the electrometallurgical demonstration project environmental assessment, the Finding of No Significant Impact for the environmental assessment, National Research Council interim status reports on the demonstration project, the 1995 Settlement Agreement and Consent Order with the State of Idaho, the EIS scoping meeting transcripts and public hearing comments, and the draft EIS hearing presentations and fact sheets. In addition, completion of the Cost Study and Nonproliferation Impacts Assessment was expedited so that they would be available to the public during the comment period. These reports were mailed to interested parties on August 12, 1999, and were made available to the public at the public hearings on the draft EIS. Although these reports are not required for the environmental impact analysis presented in the EIS, they will provide input to the Record of Decision. While the final National Research Council report on the electrometallurgical treatment demonstration project at ANL-W was published in April 2000, interim status reports were produced throughout the project and this data was used to prepare the EIS.

28-2: The commentor's objection to electrometallurgical treatment (pyroprocessing) of sodium-bonded spent nuclear fuel is noted.

Commentor No. 29: Robert H. Wilcox

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_____Forward Header_____
Subject:    DOE/EIS-0306D, Draft EIS for Treatment & Management
of Na-Bonded Spent Nuclear Fuel
Author: RBTHWILCOX@aol.com_at INTERNET
Date:    9/6/99 3:30 PM

William D Magwood, IV, Director
Office of Nuclear Energy, Science & Technology
U. S. Department of Energy (DOE)

In my opinion, the DOE has outdone itself in following blindly,
once again, its ill-advised process of using EIS's instead of sound
management to carry out its business.                                  29-1

In this instance, it has even "no preferred alternative at this
time".  And, it has determined that the alternatives evaluated in
detail would have minimal or no impacts n the remaining
environmental areas.                                                   29-2
Really!  Must we continue to waste the taxpayers money on such
analyses as opposed to getting on with the job at hand?                29-3

As an aside, it is intriguing to note that DOE appears to feel
committed to its 1995 agreement with the State of Idaho to remove
all SNF from Idaho by 2035.  Yet, DOE has appeared singularly
uninterested in honoring its legal commitment to accept custody of
SNF from the nation's power reactors, a far more urgent and
pressing matter.                                                       29-4

My recommendations are:
1. With respect to Sodium-Bonded SNF:  Get on with doing this in
Idaho, which was the plan from day one.  If given the necessary
attention, DOE surely ought to be able to accomplish this by
2035.  (How long did it take us to put a man on the moon?)             29-5

2. Please, please reexamine the need to WASTE significant
portions of the DOE budget on the stupid EIS process.  I'm not
saying that the environment should be ignored, only that DOE needs
to be more action-oriented.  Sure this might need new legislation,
but when was the last time anyone in DOE suggested to the CEO that
that might be a good idea?                                             29-3

If anyone there would like further suggestions on this subject, or
clarification of the above,  from this reviewer, please let me
know.

Yours truly,

Robert H. Wilcox,
Former USAEC Employee, Retired Foreign Service Officer & SRS
Employee,
711 Pewero Abbey Circle, Martinez, GA 30907
Tel.: (706) 855-5824
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Response to Commentor No. 29 :

29-1: DOE is required under NEPA to prepare an EIS when its actions could significantly affect the environment, as in the case of the treatment and management of DOE's sodium-bonded spent nuclear fuel. In its Finding of No Significant Impact for the environmental assessment of the Electrometallurgical Treatment Research and Demonstration Project (May 1996), DOE committed to preparing an EIS before making any significant additional use of the electrometallurgical treatment technology. DOE strongly believes that preparation of this EIS is consistent with sound management principles and its policy of fully informing both decision-makers and the public of the potential environmental consequences of any proposed action.

29-2: Council on Environmental Quality regulations (40 CFR 1502.14[e]) do not require a preferred alternative to be included in a draft EIS if one has not been identified at the time of publication. However, the regulations do require that a preferred alternative be identified in a final EIS. Section 2.8 of this EIS identifies the Preferred Alternative. The reader's comment related to minimal or no impacts is noted.

29-3: Congress determines how funds are allocated. DOE spends monies consistent with Congressional direction. DOE is not in the position to make the difficult tradeoffs that may be required between alternative Federal programs and spending priorities. The issue of spending money for the treatment and management of sodium-bonded spent nuclear fuel is beyond the scope of the SBSNF EIS.

29-4: The scope of this EIS is for the treatment and management of sodium-bonded spent nuclear fuel only. It does not include commercial nuclear power spent nuclear fuel. However, it should be noted that some of the sodium-bonded spent nuclear fuel was generated by the Fermi-1 commercial power reactor, which operated in the 1960s. In addition, DOE has issued a draft EIS for the Yucca Mountain waste repository which does address the disposal of commercial spent nuclear fuel.

29-5: The commentor's support for treating the sodium-bonded spent nuclear fuel at INEEL is noted.

Commentor No. 30: David Kipping

Forward Header
Subject: Comment on Pyroprocessing EIS
Author: kipping@compuserve.com at INTERNET
Date: 9/7/99 5:49 PM

Message authorized by: kipping@compuserve.com at INTERNET at X400PO

Dear Ms. Lesica,

Ref: "Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel"

It is essential that the comment period for the EIS be extended a minimum of 60 days (to at least 15 Nov 99). This draft EIS is very premature; much of the important information the public needs to make informed comments will not be ready for at least another month. Therefore the September 13 deadline does not allow enough time. **30-1** **30-2**

There is a great deal of information that is essential to making sound technical and policy decisions that is not in the draft EIS and, in fact, is not available at all. In particular, the following items are missing:

* The demonstration project at Argonne West on the proposed treatment--final results will not be available until the end of the September at the earliest. **30-3**

* National Academy of Sciences review of the proposed treatment. **30-4**

* Cost analysis of the various alternatives. **30-5**

* Nuclear weapons proliferation assessment by the Department of Energy. It is my understanding that this was just released last week. **30-6**

* Yucca Mountain (the purported destination of pyroprocessing waste) Environmental Impact Statement--the waste acceptance criteria are not known. **30-7**

The current draft EIS is seriously flawed due to the lack of information mentioned above. As a minimum, DOE needs to wait until all this information is available before closing the comment period. But merely extending the comment period will not achieve the result desired: an EIS that presents all the facts and allows the public to make informed comments. Much of the public will not be aware of the additional documents and/or will not have access to them. It is clear that the best approach is incorporate the above-mentioned information in a second draft EIS which then can be made available for well-informed public comment. **30-2** **30-8**

Thank you for your consideration.

David Kipping
President, Board of Directors
Snake River Alliance

Response to Commentor No. 30:

30-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

30-2: DOE does not believe that the draft EIS was produced prematurely because of a failure to present all the facts necessary for the public to make informed comments. However, DOE did extend the comment period to ensure that all interested parties had time to adequately review the draft document (64 FR 4916). DOE made material supporting the preparation of the EIS available in public reading rooms and through a series of public hearings held August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho; and August 31, 1999, in Arlington, Virginia. Materials placed in the public reading rooms included the environmental assessment for the Electrometallurgical Treatment Research and Demonstration Project, the Finding of No Significant Impact for the environmental assessment, National Research Council reports, the 1995 Settlement Agreement and Consent Order with the State of Idaho, scoping period meeting transcripts and comments, and the draft EIS hearing presentations and fact sheets. In addition, completion of the Cost Study and Nonproliferation Impacts Assessment was expedited so that these also would be available to the public during the comment period. These reports were mailed to interested parties on August 12, 1999, and were made available to the public at the public hearings on the draft EIS. Although these reports are not critical to the environmental impact analysis presented in the EIS, they will be considered during the decision-making process leading to the Record of Decision. While the final National Research Council report on the Electrometallurgical Treatment Research and Demonstration Project at ANL-W was published in April 2000, interim status reports were produced throughout the project. Data generated during the demonstration project was used in preparing the EIS, as discussed in Section 1.6.3 of the EIS.

30-3: Final test results were made available in August 1999 and were used in the EIS. The success criteria established at the outset of the project were fulfilled. The environmental impact analysis associated with the electrometallurgical process alternatives was based on actual data from the project. Section 1.6.3 of the EIS summarizes the status and the results of the project.

30-4: The National Academy of Sciences' National Research Council prepared interim status reports on the results of the Electrometallurgical Treatment

Research and Demonstration Project that have been reviewed by DOE. The National Research Council completed their evaluation of the electrometallurgical treatment demonstration project in September 1999 and published their final summary report in April 2000. The final report findings will be considered during the decision-making process leading to the Record of Decision.

30-5: The SBSNF EIS was prepared in accordance with NEPA, Council on Environmental Quality regulations on implementing NEPA (40 CFR 1500-1508), and DOE's NEPA implementation procedures (10 CFR 1021). None of these require the inclusion of a cost analysis in an EIS. As discussed in the introduction, the basic objective of this EIS is to provide the public and DOE decision-makers with a description of the reasonable alternatives for the treatment and management of DOE's sodium-bonded spent nuclear fuel and their potential environmental impacts. However, DOE issued a separate Cost Study on August 12, 1999, that analyzes and compares the costs of the alternatives analyzed in the EIS. Cost will be considered during the decision-making process in preparing the Record of Decision.

30-6: Although the assessment of nonproliferation impacts is not a part of the EIS process, DOE's Nonproliferation Impacts Assessment was mailed out to interested members of the public on August 12, 1999, and is available by request. The assessment was also placed in the DOE public reading rooms and distributed at the public hearings held during the public comment period on the draft EIS. Information from the assessment, along with other factors such as costs, schedules, environmental consequences, and technical risk will be considered during the decision-making process leading to the Record of Decision.

30-7: As discussed in Section 2.7 of this EIS, final waste acceptance criteria for a geologic repository are still being developed. DOE expects the waste forms that would be produced by the proposed action would be suitable for disposal in a geologic repository. In July 1999, DOE published a Draft Yucca Mountain EIS, which is discussed in Section 1.6.2.2 of this EIS. The Yucca Mountain EIS assumes that sodium-bonded spent nuclear fuel is treated using the electrometallurgical process prior to emplacement in the geologic repository.

30-8: DOE has made material supporting the preparation of the EIS available in public reading rooms and through a series of public hearings which were advertised in the Federal Register, as well as local newspapers. In addition, completion of the Cost Study and Nonproliferation Impacts Assessment was expedited so that these would be available to the public during the

Commentor No. 30: David Kipping

Response to Commentor No. 30 (Cont'd):

comment period. These reports were mailed to interested parties on August 12, 1999, and were made available to attendees at all of the public hearings on the draft EIS. While the final National Research Council report on the Electrometallurgical Treatment Research and Demonstration Project at ANL-W was published in April 2000, interim status reports have been produced throughout the project and these are available in the public reading rooms. Considering the additional time provided by the extension of the comment period and the availability of the data used to prepare the EIS, DOE does not feel that a second draft is warranted.

Commentor No. 31: David Hensel

09/06/1999 21:41 2083548636 HENSEL/ROBINSON PAGE 1

David Hensel
PO Box 1104
313 S. 200E.
Driggs, Id.
83422
208-354-8636
hensel@tetonvalley.net

Dear Ms. Lesica

I want to comment on the DEIS for treatment and management of sodium-bonded spent nuclear fuel.

First, I wish to ask for an extension. Far too much information is missing from the deis: **31-1**

1. the demonstration results on pyroprocessing **31-2**
2. NAS's review of the proposed treatment **31-3**
3. Cost analysis of the alternatives **31-4**
4. Nuclear weapons proliferation's risk assessment **31-5**
5. The acceptance criteria for Yucca Mt., and the EIS on Yucca Mt. **31-6**

Pyroprocessing is a bad idea. It separates out nuclear bomb grade uranium from spent fuel. Developing this technology runs counter to the USA's nonproliferation goals. The technology can be modified to separate out bomb-grade plutonium. There is nothing more fleeting than a military secret. Witness the uproar over China's stealing our bomb making secrets. Why spend tax dollars developing technology that eventually will find its way into unfriendly hands. Further developing this technology sends the rest of the world the message that the US is not serious about stopping the spread of nuclear weapons technology. **31-7**

As the DOE is aware, I hope, the INEEL is awash in extremely dangerous waste. Waste that it lacks the technology and resources to clean up. Much of this waste was produced during reprocessing. Rather than dealing with the crucial problem of cleanup, the DOE now proposes to produce more waste? This makes no sense. The cleanup budget is flat for the foreseeable future; many projects have no funding (the liquid waste tanks at the INEEL for instance). Pyroprocessing takes money that could be used much better on environmental projects. There is plenty, too much, weapons grade material and nuclear waste already-this project only produces more of the same. It is a waste of precious resources and taxpayer money. **31-8** **31-9** **31-7** **31-8** **31-9**

Thank you.

David Hensel

Response to Commentor No. 31:

31-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

31-2: The Electrometallurgical Treatment Research and Demonstration Project began in June 1996 and, although the test results have not been finalized in a single report, a number of status reports issued by the National Academy of Sciences' National Research Council Committee were considered in the preparation of the draft EIS. The success criteria established at the outset of the project were fulfilled. The environmental impact analysis associated with the electrometallurgical process alternatives was based on actual data from the project. Section 1.6.3 of the EIS summarizes the status and the results of the project.

31-3: The National Academy of Sciences' National Research Council prepared interim status reports on the results of the Electrometallurgical Treatment Research and Demonstration Project that have been reviewed by DOE. The National Research Council completed their evaluation of the electrometallurgical treatment demonstration project in September 1999 and published their final summary report in April 2000. The final report findings will be considered during the decision-making process leading to the Record of Decision.

31-4: The SBSNF EIS was prepared in accordance with NEPA, Council on Environmental Quality regulations on implementing NEPA (40 CFR 1500-1508), and DOE's NEPA implementation procedures (10 CFR 1021). None of these require the inclusion of a cost analysis in an EIS. As discussed in the introduction, the basic objective of this EIS is to provide the public and DOE decision-makers with a description of the reasonable alternatives for the treatment and management of DOE's sodium-bonded spent nuclear fuel and their potential environmental impacts. However, DOE issued a separate Cost Study on August 12, 1999, that analyzes and compares the costs of the alternatives analyzed in the EIS. Cost will be considered during the decision-making process in preparing the Record of Decision.

31-5: Although the assessment of nonproliferation impacts is not a part of the EIS process, DOE's Nonproliferation Impacts Assessment was mailed out to interested members of the public on August 12, 1999, and is available by request. The assessment was also placed in the DOE public reading rooms and distributed at the public hearings held during the public comment period on the draft EIS. Information from the assessment, along with other factors such as costs, schedules, environmental

Commentor No. 31: David Hensel

Response to Commentor No. 31 (Cont'd):

consequences, and technical risk will be considered during the decision-making process leading to the Record of Decision.

31-6: As discussed in Section 2.7 of this EIS, final waste acceptance criteria are still being developed for a geologic repository. DOE expects the waste forms produced by the proposed action would be suitable for disposal in a geologic repository. In July 1999, DOE published a Draft Yucca Mountain EIS, which is discussed in Section 1.6.2.2 of this EIS. The Yucca Mountain EIS assumes that sodium-bonded spent nuclear fuel is treated using the electrometallurgical process prior to emplacement in the geologic repository.

31-7: The assessment of nonproliferation impacts is not a part of the EIS process. None of the alternatives analyzed in this EIS would generate weapons-usable fissile materials at INEEL. Although highly enriched uranium would be an interim product, it is would be down-blended to low-enriched uranium during electrometallurgical treatment.

31-8: The sodium-bonded spent nuclear fuel at INEEL contains metallic sodium, which is chemically reactive and so can be a potentially dangerous substance in the spent nuclear fuel. This EIS evaluates the impacts of treating and managing this sodium-bonded spent nuclear fuel so that, for the analyzed alternatives, this chemically reactive and potentially dangerous sodium is removed or converted to a nonreactive form. Such treatment would reduce the danger of radioactive material releases to the environment from emplacement of this radioactive material in a geologic repository. The environmental impact of waste generated from the proposed action is addressed in Chapter 4 of the EIS.

31-9: Congress determines how funds are allocated. DOE spends monies consistent with Congressional direction. DOE is not in a position to make the difficult tradeoffs that may be required between alternative Federal programs and spending priorities. The issue of funding for the treatment and management of sodium-bonded spent nuclear fuel is beyond the scope of the SBSNF EIS.

Commentor No. 32: Lowell Jobe

SB SNF Toll Free Line

9/8/99

Lowell Jobe
Coalition 21
14469 N 55th East
Idaho Falls, ID 83401
hm: 208-524-7271
fax: 208-524-0998

Coalition 21: 208-542-1575

I am calling to ask if there will be an extension on the comment period. We have found some serious questions regarding the cost report figures and tables and feel they need answering before we can finalize our conclusions and comments. Please advise us by phone. Please leave an answer on our answering machines if we are not there. **32-1** **32-2**

Response to Commentor No. 32:

32-1: In an effort to ensure that all interested parties had time to comment on the Draft EIS, the deadline for transmittal of comments was extended from September 13, 1999, to September 28, 1999 (64 FR 49169).

32-2: Actual costs for treating and managing sodium-bonded spent nuclear fuel are not part of the scope of the EIS. DOE welcomes questions concerning the August 1999 Cost Study.

Commentor No. 33: Lisa Johnson

Ms. Susan Lesica
US Department of Energy
Office of Nuclear Facilities Management, NE-40
19901 Germantown Road
Germantown, Maryland 20874-1290

Dear Ms. Lesica,

I am commenting on the DEIS for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel.

Our family, which includes young children, lives downwind of the Idaho National Engineering and Environmental Lab. I am very concerned about our family's health and the quality of the environment in the region due to the many activities that occur at the lab. **33-1**

I have several comments about this project and DEIS. The general feeling among our friends is that pyroprocessing is not an acceptable project for INEEL because of the following factors: **33-2**

- It creates new forms of nuclear waste, an issue that is already a huge problem at INEEL. **33-3**
- It takes money away from greater environmental problems at INEEL. **33-4**
- It wastes taxpayer money (Don't forget it has been mentioned twice on NBC new's "Fleecing of America"). **33-5**
- And it creates bomb-grade uranium from spent fuel and thus runs counter to US nonproliferation goals.

It seems clear that a 60-day extension of the comment period is necessary because so much relevant information is not yet available. For example: **33-6**

- The DOE does not have the results of the demonstration project on pyroprocessing. **33-7**
- The review from the National Academy of Sciences of the proposed treatment is not yet available. **33-8**
- The Department of Energy's nuclear weapons proliferation assessment is not included. **33-9**
- The waste acceptance criteria is not known because the Yucca Mountain EIS is not included (the purported destination of the waste). **33-10**

Once again, I do not support pyroprocessing at INEEL and a 60-day extension of the comment period is necessary because so much pertinent information is missing from the document. **33-2** **33-6**

Sincerely,

Lisa Johnson
PO Box 542
Victor ID 83455

Response to Commentor No. 33:

33-1: As indicated in the EIS, the human health effects resulting from operational activities to treat and manage the sodium-bonded fuel are very small. The estimated cumulative health effects to the public residing in the vicinity of INEEL from current and reasonably foreseeable future activities are summarized in Section 4.11.1.4 of the EIS. As indicated in this section, the expected health effects from these activities are very small. For example, an individual residing at the INEEL site boundary would be expected to receive a maximum radiation dose of 0.4 millirem per year from all releases, compared to natural background doses of 360 millirem per year, and are well below the regulatory limit of 10 millirem per year. Appendix E, Section E.2.1, of the EIS provides the Federal and DOE regulatory limits on radiation exposures.

33-2: The commentor's objection to electrometallurgical treatment (pyroprocessing) of sodium-bonded spent nuclear fuel at INEEL is noted.

33-3: All of the alternatives evaluated in this EIS would produce some forms of high-level radioactive waste. Electrometallurgical treatment (or pyroprocessing) would produce two new waste forms, both of which are more stable than untreated sodium-bonded spent nuclear fuel. DOE expects that these waste forms would be suitable for disposal in a geologic repository. Treatment of current high-level radioactive waste at INEEL is being evaluated in the Idaho High-Level Waste and Facilities Disposition Draft EIS, which is discussed in Section 1.6.2.3 of this EIS.

33-4: Congress determines how funds are allocated. DOE spends monies consistent with Congressional direction. DOE is not in a position to make the difficult tradeoffs that may be required between alternative Federal programs and spending priorities. The issue of funding for the treatment and management of sodium-bonded spent nuclear fuel is beyond the scope of the SBSNF EIS.

33-5: The assessment of nonproliferation impacts is not a part of the scope of the EIS. None of the alternatives analyzed in this EIS would generate weapons-usable fissile materials at INEEL. Although highly enriched uranium would be an interim product, it would be down-blended to low-enriched uranium during electrometallurgical treatment.

33-6: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169). DOE made materials relevant to the review of the draft EIS available in public reading rooms and at a series of public hearings that were held on August 17, 1999, in North

Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho; and August 31, 1999, in Arlington, Virginia. The materials placed in the reading rooms included the electrometallurgical demonstration project environmental assessment, the Finding of No Significant Impact for the environmental assessment, National Research Council interim status reports on the demonstration project, the 1995 Settlement Agreement and Consent Order with the State of Idaho, the EIS scoping meeting transcripts and public hearing comments, and the draft EIS hearing presentations and fact sheets. In addition, completion of the Cost Study and Nonproliferation Impacts Assessment was expedited so that they would be available to the public during the comment period. These reports were mailed to interested parties on August 12, 1999, and were made available to the public at the public hearings on the draft EIS. Although these reports are not critical to the environmental impact analysis presented in the EIS, they will provide input to the Record of Decision. While the final National Research Council report on the electrometallurgical treatment demonstration project at ANL-W was published in April 2000, interim status reports were produced throughout the project and this data was used to prepare the EIS as discussed in Section 1.6.3 of the EIS.

33-7: Final test results were made available in August 1999 and were used in the EIS. The success criteria established at the outset of the project were fulfilled. The environmental impact analysis associated with the electrometallurgical process alternatives was based on actual data from the project. Section 1.6.3 of the EIS summarizes the status and the results of the project.

33-8: The National Academy of Sciences' National Research Council prepared interim status reports on the results of the Electrometallurgical Treatment Research and Demonstration Project that have been reviewed by DOE. The National Research Council completed their evaluation of the electrometallurgical treatment demonstration project in September 1999 and published their final summary report in April 2000. The final report findings will be considered during the decision-making process leading to the Record of Decision.

33-9: Although the assessment of nonproliferation impacts is not a part of the EIS process, DOE's Nonproliferation Impacts Assessment was mailed out to interested members of the public on August 12, 1999, and is available by request. The assessment was also placed in the DOE public reading rooms and distributed at the public hearings held during the public comment period

Commentor No. 33: Lisa Johnson

Response to Commentor No. 33 (Cont'd):

on the draft EIS. Information from the assessment, along with other factors such as costs, schedules, environmental consequences, and technical risk will be considered during the decision-making process leading to the Record of Decision.

33-10: As discussed in Section 2.7 of the EIS, final waste acceptance criteria for a geologic repository are still being developed. DOE expects the waste forms that would be produced by the proposed action would be suitable for disposal in a geologic repository. In July 1999, DOE published a Draft Yucca Mountain EIS, which is discussed in Section 1.6.2.2 of this EIS. The Yucca Mountain EIS assumes that sodium-bonded spent nuclear fuel is treated using the electrometallurgical process prior to emplacement in the geologic repository.

Commentor No. 34: Dan Johnston

From: Daniel.C.Johnston@rl.Doe.gov_at_INTERNET at X400PO
Date: 9/13/99 8:37PM -0700
To: EMTEIS at NE-02
*cc: dcjohnston@rl.doe.gov_at_INTERNET at X400PO
Subject: Comments to Na-bonded Fuel EIS

Please see the following comments.

Comments to the Draft Environmental Impact Statement for the
Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

(Doc No DOE EIS-03060, July 1999)

The document appears complete and addresses the FFTF Sodium-Bonded fuel. The transportation issues are not specifically identified, but the different radiation and risk values shown for the various alternatives indicate they have been addressed. **34-1**

My only major concern is what appears to be a difference in how the PU and U are handled as the sodium-bonded spent nuclear fuel is run through the Electro-metallurgical Treatment Process as described in paragraph S.3.1 on page S-13. The PU is lumped in with the other fission products whereas the U is specifically collected and removed, then diluted as necessary. **34-2**

Does this uncontrolled gathering of PU guarantee sufficient criticality control for the PU in this process, or should the likelihood of pockets of PU and PU compounds of varying concentrations be acknowledged and monitored with identified actions to be taken to ensure safe handling?

From: Dan Johnston
1471 Amon Ct.
Richland, Wa. 99352

Response to Commentor No. 34:

34-1: As stated in Sections 2.2.3 and 4.2 of this EIS, pursuant to the amended Record of Decision for the DOE Programmatic Spent Nuclear Fuel EIS (61 FR 9441), the sodium-bonded Fast Flux Test Facility fuel would be transported from Hanford to INEEL. The environmental impacts associated with transport of the Fast Flux Test Facility fuel to INEEL are summarized in Appendix G of this EIS by referencing the Programmatic Spent Nuclear Fuel EIS.

34-2: As stated in Appendix C, Section C.1 of the EIS, during electrometallurgical treatment of the sodium-bonded fuel, there are strict criticality controls in place for all aspects of the process. In the electrorefiner, the plutonium would be in a chloride compound in liquid state and would be homogeneously mixed with the other salts. Abnormal localized concentrations of plutonium within the electrorefiner have been analyzed for a number of scenarios. These analyses have confirmed that an adequate margin of criticality safety would exist even under these conditions. Nevertheless, actual operations would carefully monitor the level of plutonium at all stages of the process in order to ensure the early detection of any abnormal conditions that should arise. The concentration of plutonium in the salt would be monitored through repeated sampling. When the salt is stabilized into the ceramic waste, the transuranic and fission products would be uniformly distributed throughout the waste form, which has been confirmed by sampling. The maximum plutonium concentration in the salt would be about 8 weight percent. A conservative criticality assessment was performed on the ceramic waste form. The results of this assessment showed that the plutonium concentration in the waste form would pose no criticality safety concerns.

Commentor No. 35: Carol Murphy

09/13/1999 13:19 208/2005?? ...

CAROL MURPHY
PO BOX 4714
KETCHUM ID 83340
(208) 726 5129

TO: MS SUSAN LESICA
US DEPT of ENERGY
OFFICE OF NUCLEAR FACILITIES MGMNT.
19901 GERMANTOWN RD.
GERMANTOWN, MD. 20874-1290

Dear Ms. Lesica,

My family and I are opposed to pyroprocessing at the INEEL in Idaho for several reasons. First, it is a tremendous waste of taxpayers dollars. Second, we do not need new forms of nuclear waste, which this process will create. Third, the money should be diverted + used elsewhere for more pressing environmental problems at the INEEL. Last, we do not need to be seperating our more "bomb-grade" uranium. **35-1**

We also are urging you to extend the comment period for 60 to 90 days or until well after the Yucca Mountain EIS has been released. This is important because if Yucca Mtn. is to be the destination of the pyro-processing waste, we cannot rationally evaluate it until we have an EIS from Yucca Mtn. We also need cost evaluations from all alternatives. **35-2** **35-3** **35-2** **35-4** **35-5** **35-6** **35-7**

Too much is unanswered, unspecified and unstudied. Too much is not documented and not reviewed. **35-8**

Please extend the comment period past Sept 28, 1999 and note that we are opposed to pyro-processing in general.

Thank you, Carol Murphy + family
DAN Bob Malida

Response to Commentor No. 35:

35-1: The commentor's objection to electrometallurgical treatment (pyroprocessing) of sodium-bonded spent nuclear fuel at INEEL is noted.

35-2: Congress determines how funds are allocated. DOE spends monies consistent with Congressional direction. DOE is not in a position to make the difficult tradeoffs that may be required between alternative Federal programs and spending priorities. Although not within the scope of this EIS, a separate Cost Study of the alternatives analyzed in the EIS has been developed and is available to the public. This Cost Study evaluates the cost of each alternative, including no action.

35-3: All of the alternatives evaluated in this EIS would produce some forms of high-level radioactive waste. Electrometallurgical treatment (pyroprocessing) would produce two new waste forms, both of which are more stable than untreated sodium-bonded spent nuclear fuel. DOE expects that these waste forms would be suitable for disposal in a geologic repository. Treatment of current high-level radioactive waste at INEEL is being evaluated in the Idaho High-Level Waste and Facilities Disposition EIS, which is discussed in Section 1.6.2 of this EIS.

35-4: None of the alternatives analyzed in this EIS would generate weapons-usable fissile materials at INEEL. Although highly enriched uranium would be an interim product, it would be down-blended to low-enriched uranium during electrometallurgical treatment.

35-5: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

35-6: The Yucca Mountain Draft EIS was released in July 1999. Relevant information from the Yucca Mountain Draft EIS was incorporated into Section 1.6.2 of this SBSNF EIS.

35-7 DOE issued a separate Cost Study that analyzes and compares the cost of alternatives analyzed in the EIS. Cost will be considered during the decision-making process in preparing the Record of Decision

35-8: The information needed to make a decision concerning the treatment and management of DOE's sodium-bonded spent nuclear fuel was obtained and analyzed in the EIS. This information included input from the public, as well as from Federal, state and local agencies, and Tribal governments. Also included was site-specific information on the environmental conditions prevailing at ANL-W, INEEL, and SRS, as well as documentation related to each of the proposed treatment technologies. For example, data from

Commentor No. 35: Carol Murphy

Response to Commentor No. 35: (Cont'd)

DOE's Electrometallurgical Treatment Research and Demonstration Project were used to prepare the EIS. The results of this project are documented in a series of reports published by ANL-W and reviewed by the National Research Council. All of the materials used to prepare the EIS are referenced at the end of each chapter.

Commentor No. 36: David E. Adelman

September 13, 1999

Ms. Susan Lesica
U.S. Department of Energy
Office of Nuclear Facilities Management, NE-40
19901 Germantown Road
Germantown, Maryland 20874-1290

Dear Ms. Lesica:

Please find the enclosed comments of the Natural Resources Defense Council, Inc., on the Department of Energy's Draft Environment Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel (DOE/EIS-0306D). Should you have any questions, I can be reached at (202) 289-6868. Thank you very much for your assistance.

Sincerely,

David E. Adelman
Project Attorney, Nuclear Program

Response to Commentor No. 36:

Commentor No. 36: David E. Adelman (Cont'd)

Comments of the Natural Resources Defense Council on The Department of Energy's Draft Environment Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

The Draft Environmental Impact Statement ("EIS") for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel represents a substantial improvement from the Notice of Intent for the EIS. In particular, the EIS treats separately the analysis of high-burnup driver fuel elements and low-burnup blanket fuel elements. This is a critical distinction to make because the sodium in blanket fuel can be readily removed using mechanical methods. In addition, although not complete, DOE has broadened the alternatives analysis by considering technologies beyond electrometallurgical treatment ("EMT") and PUREX reprocessing. The inclusion of direct disposal of blanket fuel elements and melt-and-dilute treatment of blanket and driver fuel elements are of particular importance because of their reduced environmental and non-proliferation impacts. **36-1**

A number of deficiencies persist, both in terms of the process and the substance of the EIS itself. First, the EIS process is proceeding despite the pending National Academy of Sciences report evaluating the EMT technology. The EIS would benefit substantially from the determinations of the Academy's report, particularly in assessing its viability and impacts relative to other methods. DOE has also arbitrarily prepared separate reports on the costs and non-proliferation implications of the alternatives considered in the EIS, and released them without any opportunity for public comment. These assessments should have been incorporated into the Draft EIS and released for public comment. Further research and development of the alternatives considered should also be completed prior to finalizing the EIS to ensure that their viability and environmental impacts are considered fully. **36-2** **36-3** **36-4**

I. DOE Marginalizes Methods Other Than EMT for Processing Driver Fuel Elements

DOE's primary justification for proposing treatment of sodium-bonded fuel using the EMT technology is the reactivity of the bonded-sodium in the fuel, which according to DOE precludes direct disposal of these fuel elements. As DOE has acknowledged, this justification applies, at most, to the driver fuel elements because the sodium can be removed mechanically from the blanket fuel, making it acceptable for direct disposal in a geologic repository. Blanket fuel constitutes more than 95 percent of the fuel to be processed; driver fuel accounts for only three tons of the total 60 tons in storage. With such a limited amount of material to be processed, it makes little sense to invest the time and money in the EMT technology, particularly given the non-proliferation risks associated with its capacity to be used for plutonium extraction.[1] **36-5**

[1] The National Academy of Sciences has already expressed concern about this risk: "Although the developers of the electrometallurgical technique argue that the technology is proliferation resistant, any SNF processing approach that is capable of separating fissionable materials from associated fission products and transuranic elements could be redirected to produce material with nuclear detonation capability . . . . Demonstration of the process could, however, add to the risk that a nation intent on weapons production might consider adapting this technology for possible production of fissile material, although such material would be of poor quality for a weapon." Fred Basolo et al., *An Assessment of Continued R&D Into an Electrometallurgical Approach for Treating DOE Spent Nuclear Fuel*, S-2 (National Research Council, 1995).

Response to Commentor No. 36 (Cont'd):

36-1: The comment is noted. DOE revised the scope of the EIS based on comments provided during the public scoping period.

36-2: The National Academy of Sciences' National Research Council prepared interim status reports on the results of the Electrometallurgical Treatment Research and Demonstration Project that have been reviewed by DOE. The National Research Council completed their evaluation of the electrometallurgical treatment demonstration project in September 1999 and published their final summary report in April 2000. The final report findings will be considered during the decision-making process leading to the Record of Decision.

36-3: The Cost Study and Nonproliferation Impacts Assessment were prepared to provide additional pertinent information to the Secretary of Energy so that he may make an informed decision concerning the treatment and management of DOE's sodium-bonded spent nuclear fuel. These documents were mailed to interested parties on August 12, 1999, and were made available to attendees at all of the public hearings on the draft EIS. It should be noted that, although NEPA does not require inclusion of the information provided in the Cost Study and the Nonproliferation Impacts Assessment in the EIS, this information will be considered along with other pertinent data when the Record of Decision is prepared. Also, members of the public are free to direct any comments they may have on the Cost Study and Nonproliferation Impacts Assessment to DOE.

36-4: The current state of development of each treatment technology is described in Chapter 2 of the EIS. DOE recognizes that the treatment methods vary in their current state of development, and this was a factor in dismissing GMODS and the direct plasma arc-vitreous ceramic and chloride volatility processes from evaluation at this time. However, it was felt that the technologies analyzed in the EIS were developed to a sufficient level of maturity to permit consideration of their environmental impacts. It was not practical or necessary to wait until research on each technology has proceeded to a similar point prior to preparing the EIS. It should be noted that, under the option of continued storage under the No Action Alternative, the sodium-bonded spent nuclear fuel would continue to be stored safely until a less mature technology is developed to the point that it becomes a reasonable treatment alternative.

36-5: The commentor feels that DOE has not given other methods of treating sodium-bonded spent nuclear fuel the same consideration as electrometallurgical treatment. As stated in Section 1.3 of the EIS, as a

Commentor No. 36: David E. Adelman (Cont'd)

Reliance on other existing technologies or technology development programs must be adequately assessed in the EIS. Yet, in the Draft EIS only one of the six alternatives evaluated assesses a treatment method for the driver fuel other than the EMT technology. Further, this alternative ends up being the most costly because it involves melt-and-dilute treatment of the entire 60 tons of sodium-bonded fuel, as opposed to the 3 tons of driver fuel, and the treatment site is ANL-W, rather than the existing facility at the Savannah River Site ("SRS"). This illustrates a limitation of the current structure of the EIS. It would be more informative to provide environmental impact and cost information for the treatment of the two types of spent nuclear fuel separately. This would help identify the most environmentally protective (and cost effective) combination of treatment methods. **36-6** **36-7** **36-8** **36-7**

For example, DOE has not evaluated an alternative in which the blanket fuel is disposed of directly after removal of the bonded-sodium and the driver fuel is treated using the melt-and-dilute technology and facilities being developed at SRS.[2] Utilization of the existing SRS program would reduce costs by eliminating duplicative DOE research and development programs and facilities and benefit from economies of scale, which would in turn reduce their aggregate environmental impacts. The EIS must also include an evaluation of the reactivity of the sodium in the driver fuel and the potential risks this creates for its long-term disposal. It may be that the interdiffusion of the fuel, sodium, and cladding substantially reduces the reactivity of the sodium, making it acceptable for direct disposal in a geologic repository without further treatment. These alternatives, and their variants, must be evaluated in the EIS to arrive at the appropriate combination of treatment technologies for the driver and blanket fuel elements. **36-6** **36-9** **36-10** **36-6**

II. Conclusion

It is critical that DOE evaluate treatment strategies for the blanket and driver fuel elements separately. The EIS would benefit substantially from having the environmental and costs analyses of each treatment method presented separately for each fuel type. It is also essential that DOE evaluate alternatives that take advantage of existing technologies and programs, particularly the rapidly progressing melt-and-dilute project at SRS and well established mechanical methods for removing sodium from fuel elements. Finally, DOE cannot arbitrarily remove certain portions of its analysis, particularly its non-proliferation assessment, from the EIS; all aspects of DOE's assessment should be part of the EIS and available for public review and comment. **36-11** **36-8** **36-12** **36-13**

David E. Adelman
Project Attorney, Nuclear Program

[2] According to Natraj Iyer, the manager of the SRS melt-and-dilute program, "it is very realistic to make [the melt-and-dilute program a] success[]." He has also stated that they can allay the concerns that the Defense Nuclear Safety Board has raised.

Response to Commentor No. 36 (Cont'd):

result of comments received during the scoping period, DOE changed the proposed action of the EIS, the structure of alternatives, and the title of the EIS from the "Electrometallurgical Treatment of Sodium-Bonded Spent Nuclear Fuel in the Fuel Conditioning Facility at Argonne National Laboratory-West" to the "Treatment and Management of Sodium-Bonded Spent Nuclear Fuel." This change was made to address public concern about potential bias toward one treatment technology over others. The alternatives evaluated in the EIS were restructured to reflect differences in the characteristics of driver and blanket sodium-bonded spent nuclear fuel. Several alternatives were added to the EIS to address the treatment of driver and blanket spent nuclear fuel by different technologies. Conversely, because of the characteristics of sodium-bonded spent nuclear driver fuel, the maturity of existing technologies, and the availability of existing facilities to treat and manage the driver spent nuclear fuel, treatment technologies for driver spent nuclear fuel are currently limited to electrometallurgical and melt and dilute treatment technologies. A range of reasonable alternatives and technologies for the treatment of driver and blanket sodium-bonded spent nuclear fuel, as well as the No Action Alternative that includes direct disposal with no treatment, were evaluated in the EIS. In parallel, a separate assessment was conducted on the nonproliferation characteristics of all the treatment technologies considered in the EIS. The EIS and the conclusions of the Nonproliferation Impacts Assessment, along with other factors, will be considered during the decision-making process prior to publication of the Record of Decision.

36-6: As discussed in Section 2.5 of the EIS, although each alternative evaluates the treatment of both driver and blanket sodium-bonded spent nuclear fuel, the environmental impact analyses are sufficient to allow DOE to consider the separate treatment of driver and blanket fuel. As a result of the commentor's remarks, the possibility of treating sodium-bonded driver spent nuclear fuel using the melt and dilute process at the Savannah River Site was considered. It was dismissed from further evaluation, however, as indicated in the revised Section 2.6 of the EIS.

36-7: In response to public comments received at the public scoping meetings, DOE decided to analyze the driver and blanket spent nuclear fuel separately. Six treatment alternatives were evaluated in the EIS that included various combinations of fuel type and site location. However, as stated in Section 2.6 of the EIS, when preparing the Record of Decision DOE will consider all combinations of technologies, options, and fuel types, including those not among the specific combinations explicitly considered in the EIS.

Commentor No. 36: David E. Adelman

Response to Commentor No. 36 (Cont'd):

36-8: The SBSNF EIS was prepared in accordance with NEPA, Council on Environmental Quality regulations on implementing NEPA (40 CFR 1500-1508), and DOE's NEPA implementation procedures (10 CFR 1021). None of these require the inclusion of a cost analysis in an EIS. As discussed in the introduction, the basic objective of this EIS is to provide the public and DOE decision-makers with a description of the reasonable alternatives for the treatment and management of DOE's sodium-bonded spent nuclear fuel and their potential environmental impacts. However, DOE issued a separate Cost Study on August 12, 1999, that analyzes and compares the costs of the alternatives analyzed in the EIS. Cost will be considered during the decision-making process in preparing the Record of Decision.

36-9: Actual costs for treating and managing sodium-bonded spent nuclear fuel are not part of the EIS process. However, the cost of using SRS facilities is included in the August 1999 Cost Study. Cost will be one of the factors considered in preparing the Record of Decision for the treatment and management of sodium-bonded spent nuclear fuel.

36-10: As discussed in Section E.4.6, the EBR-II fuel at INTEC's Basins 666 and 66 are stored inside sealed stainless steel cans that prevent the contact of basin water with the fuel cladding. During the average 17 years of storage in Basin 666, 10 of the 2,148 cans were confirmed to have water in-leakage. With water inside these cans, a fuel-water reaction produced hydrogen gas, which created bubbles that allowed detection of the water in-leakage. These observations are consistent with the fact that sodium and metallic uranium react with water to produce hydrogen and this is the reason that all the sodium-bonded spent nuclear fuel is stored in dry storage or sealed containers that prevent the exposure of the fuel cladding to water. Under storage conditions in a geologic repository, fuel cladding could disintegrate over time, leading to the collection of a large amount of sodium within the confines of the storage can. If this fuel can were to fail, a large amount of sodium would be available to react with water in the repository. This could produce a violent reaction. DOE considers this condition to be unacceptable. The EIS, under the No Action alternative, analyzes a direct disposal option that is conditional on the acceptability of untreated sodium-bonded spent nuclear fuel in a repository. However, the feasibility and acceptability of such action remains to be determined.

36-11: Although each alternative presented in the EIS addresses the combined treatment and management of both driver and blanket sodium-bonded spent nuclear fuel, the analyses presented in Chapter 4 evaluate the impacts of the separate treatment of driver and blanket spent nuclear fuel. As

Commentor No. 36: David E. Adelman (Cont'd)

Response to Commentor No. 36 (Cont'd):

discussed in Section 2.5, DOE will consider the separate treatment of driver and blanket spent nuclear fuel in identifying a preferred alternative. In other words, DOE will consider combinations of technologies, options, and fuel types, including combinations not included among the specific combinations considered in the EIS.

36-12: The EIS evaluates reasonable treatment technologies (including existing technologies and programs) for the treatment and management of sodium-bonded spent nuclear fuel. The melt and dilute treatment process is part of Alternative 5, which is described in Section 2.5.6 of the EIS. The melt and dilute treatment process is also described in greater detail in Section 2.3.4 and Appendix C, Section C.5. The methods considered for removing metallic sodium from blanket sodium-bonded spent nuclear fuel elements are described in Section 2.3.9.

36-13: The Nonproliferation Impacts Assessment was prepared to provide additional pertinent information to the Secretary of Energy so that he may make an informed decision with respect to the treatment and management of DOE's sodium-bonded spent nuclear fuel. This document was mailed to interested parties on August 12, 1999, and was made available to attendees at all of the public hearings on the draft EIS. It should be noted that, although NEPA does not require inclusion of the information provided in the Nonproliferation Impacts Assessment in the EIS, it will be considered along with other pertinent data when the Record of Decision is prepared. Also, members of the public are free to direct any comments they may have on the Nonproliferation Impacts Assessment to DOE.

Commentor No. 37: Carol Murphy

SB SNF Toll Free Line

9/13/99

Carol Murphy
Dan Freeman

208-726-5929

I am calling to comment on the draft EIS. I am against pyroprocessing at the INEEL in Idaho and I'm also calling to request a 60 day extension. I understand that its been extended to September 28th but I believe it should be extended to at least the middle of November to get an EIS for Yucca Mountain and also until a full cost analysis has been done on different alternatives and several other reasons. I've written a letter. **37-1** **37-2** **37-3**

Response to Commentor No. 37:

37-1: The commentor's objection to electrometallurgical treatment (pyroprocessing) of sodium-bonded spent nuclear fuel at INEEL is noted.

37-2: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13, to September 28, 1999 (64 FR 49169).

37-3: At the request of several members of the public, DOE prepared and issued a separate Cost Study during the public comment period on the draft EIS. Copies of the Cost Study were mailed to interested members of the public and were also available at the four public hearings during August 1999. The Yucca Mountain EIS was issued in July 1999.

Commentor No. 38: Suzy Nielond

SB SNF Toll Free Line

9/20/99

Suzy Nielond

307-739-2430

My comment is that I think you should extend the comment period. We need at least 60 days minimum to at least find out about this and get all the information about this before we decide that it`s a bad idea which some of us have decided already. And that`s my comment I'm calling from Jackson, Wyoming. **38-1**

Response to Commentor No. 38:

38-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169). DOE made materials relevant to the review of the draft EIS available in public reading rooms and at a series of public hearings that were held on August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho and August 31, 1999, in Arlington, Virginia. The materials placed in the reading rooms included the electrometallurgical demonstration project environmental assessment, the Finding of No Significant Impact for the environmental assessment, National Research Council interim status reports on the demonstration project, the 1995 Settlement Agreement and Consent Order with the State of Idaho, the EIS scoping meeting transcripts and public hearing comments, and the draft EIS hearing presentations and fact sheets. In addition, completion of the Cost Study and Nonproliferation Impacts Assessment was expedited so that they would be available to the public during the comment period. These reports were mailed to interested parties on August 12, 1999, and were made available to the public at the public hearings on the draft EIS. Although these reports are not critical to the environmental impact analysis presented in the EIS, they will provide input to the Record of Decision. While the final National Research Council report on the electrometallurgical treatment demonstration project at ANL-W was published in April 2000, interim status reports were produced throughout the project and this data was used to prepare the EIS, as discussed in Section 1.6.3 of the EIS.

Commentor No. 39: Carol Murphy and Dan Freeman

CAROL MURPHY
PO BOX 4714
KETCHUM, ID.
83340

DAN FREEMAN
PO BOX 4285
KETCHUM, ID
83340

Ms. Susan Lesica
US DEPT of ENERGY
OFFICE OF NUCLEAR FACILITIES MNGMNT, NE 40
19901 GERMANTOWN RD
GERMANTOWN, MD. 20874-1290

Dear Ms. Lesica, Sept. 11, 1999

We are writing for two reasons.

One, is to ask for an extension on the comment period for the "DEIS for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel." We would like to see this comment period extended at least 60 days. We feel this is necessary because so much of the information relevant to the procedure is still unavailable. The public has the right to review this information, especially those of us in Idaho, therefore the comment period must be extended. PLEASE! **39-1** **39-2**

Secondly, we are writing to express our dissatisfaction with this proposed project for pyroprocessing. It is wasteful, takes money away from even greater environmental problems at the INEEL, and is just too efficient at "corporate welfare." Please DO NOT WASTE OUR TAXPAYER DOLLARS. PLEASE, DO NOT CREATE MORE NUCLEAR WASTE IN IDAHO or ANYWHERE ELSE. **39-3** **39-4** **39-5**

In summary, we are opposed to the procedure of pyroprocessing at the INEEL, and we feel that the comment period on the DEIS for this procedure needs to be extended for at least 60 days, and especially until the Yucca Mountain EIS is released.

Thank you for reading our comments.

Sincerely,

Carol Murphy
B.A. Economics
The Colorado College

Dan Freeman
B.A. Philosophy
Harvard University

Response to Commentor No. 39:

39-1: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

39-2: DOE made materials supporting preparation of the EIS available in the public reading rooms and at the public hearings held on August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho; and August 31, 1999, in Arlington, Virginia. These materials included the environmental assessment for the Electrometallurgical Treatment Research and Demonstration Project, the Finding of No Significant Impact for the environmental assessment, National Research Council reports, the 1995 Settlement Agreement and Consent Order with the State of Idaho, scoping period meeting transcripts and comments, and the draft EIS hearing presentations and fact sheets. In addition, completion of the Cost Study and Nonproliferation Impacts Assessment was expedited so that they also would be available to the public during the comment period. These reports were mailed to interested parties on August 12, 1999, and were available at the public hearings on the draft EIS. Although these reports are not critical to the environmental impact analysis presented in the EIS, they will be considered during the decision-making process in the preparation of the Record of Decision. While the final National Research Council report on the Electrometallurgical Treatment Research and Demonstration Project at ANL-W was published in April 2000, interim status reports were produced throughout the project. Data generated during the demonstration project were used in preparing the EIS, is discussed in Section 1.6.3 of the EIS.

39-3: The commentor's objection to electrometallurgical treatment (pyroprocessing) of sodium-bonded spent nuclear fuel is noted.

39-4: Congress determines how funds are allocated. DOE spends monies consistent with Congressional direction. DOE is not in a position to make the difficult tradeoffs that may be required between alternative Federal programs and spending priorities. The issue of funding for the treatment and management of sodium-bonded spent nuclear fuel is beyond the scope of the SBSNF EIS.

39-5: Chapter 4 of the EIS presents data that demonstrates that, compared to leaving the sodium-bonded spent nuclear fuel in its current form, treatment and management of the sodium-bonded spent nuclear fuel would significantly reduce the volume of high-level radioactive waste that needs to be disposed of in a geologic repository.

Commentor No. 40: Julie Bowles

SB SNF Toll Free Line

9/27/99

Julie Bowles
7209 Valley Heights Drive
Boise, ID 83709

I am in favor of not doing the pryoprocessing and that I think that it's a cost issue. I think it's a health issue and I understand that the DOE is looking at not doing it at INEEL and I think that's the right way to go. **40-1,-2** **40-3,-1**

Response to Commentor No. 40:

40-1: The commentor's objections to electrometallurgical treatment (pyroprocessing) of sodium-bonded spent nuclear fuel at INEEL is noted. The commentor's support for other alternatives is also noted.

40-2: Actual costs for treating and managing sodium-bonded spent nuclear fuel are not part of the EIS process. However, the Cost Study shows that electrometallurgical treatment (pyroprocessing) of the sodium-bonded spent nuclear fuel is neither the most nor least expensive alternative. Information from the Cost Study, the EIS, the public comments, and other sources will factor into the decision-making process leading to the Record of Decision.

40-3: As indicated in the EIS, the human health effects resulting from operational activities to treat and manage sodium-bonded fuel are very small. The estimated cumulative health effects to the public residing in the vicinity of INEEL from current and reasonably foreseeable future activities are summarized in Section 4.11.1.4 of the EIS. As indicated in this section, the expected health effects from these activities are very small. For example, an individual residing at the INEEL site boundary would be expected to receive a maximum radiation dose of 0.065 millirem per year from all releases, compared to natural background doses of 360 millirem per year, and are well below the regulatory limit of 10 millirem per year. Appendix E, Section E.2.1, of the EIS provides the Federal and DOE regulatory limits on radiation exposures.

Commentor No. 41: Steve Hopkins

FROM : FAX NO. : Sep. 28 1999 01:49PM P1

Snake River Alliance

Box 1731 · Boise ID 83701 · 208/344-9161 · Fax 208/344-9365 · Email: allister@snakeriveralliance.org
Box 4090 · Ketchum ID 83340 · 208/726-7271 · Fax 208-726-1531 · Email: mstewart@snakeriveralliance.org
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September 28, 1999

Susan Lesica, Document Manager
Office of Nuclear Facilities Management
Office of Nuclear Energy, Science, and Technology
US Department of Energy, NE-40
19901 Germantown Road
Germantown, MD 20874-1290

Re: Comments of the Snake River Alliance on the "Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel"

Dear Ms. Lesica,

The following comments are made on behalf of the 1,300 members of the Snake River Alliance, an Idaho-based grassroots group that has monitored activities at the Idaho National Engineering and Environmental Laboratory since 1979.

Thank you for the opportunity to comment on this DEIS and for extending the public comment period. In addition, we thank you for analyzing the blanket and driver fuel separately due to their different chemical and radiological properties, and for refocusing the scope of the project to reflect possible need for treatment in general as opposed to need for treatment by pyroprocessing. **41-1**

As we previously stated during the scoping process on the Department of Energy's preparation of an environmental impact statement on electrometallurgical treatment (pyroprocessing) of sodium-bonded spent nuclear fuel, the preparation of this EIS is premature. In fact, if you should proceed with selecting pyroprocessing of this special case spent fuel at this time you will be admitting you are doing so for reasons that clearly have nothing to do with protection of human health and the environment. **41-2**

The fact that the DOE has reinstated funding to hold the Argonne pyroprocessing workforce in place between the start of FY2000 (for which no funding was previously requested) and the record of decision that will grow from the draft EIS is ample grounds for suspecting that the budget process rather than sound science is the driving force behind this EIS process. A DOE source quoted in Nucleonics Week, June 8, 1995, admitted to as much when he described pyroprocessing at Argonne-West as "just about the only thing they have left to do. . . . It's a jobs issue." **41-3**

During the environmental assessment process for the pyroprocessing demonstration project, Argonne argued that the number of blanket and driver spent fuel elements proposed for treatment through the EA was the absolute minimum required for **41-4**

Response to Commentor No. 41:

41-1: The comment is noted. DOE revised the scope of the EIS based on comments provided during the public scoping period.

41-2: DOE is committed to improving its environmental management practices, to operating its facilities in a manner that meets or exceeds all applicable environmental, safety, and health requirements, and to the cleanup of its environmental problems. The focus of the EIS is to assess the potential environmental and health impacts associated with the treatment and management of sodium-bonded spent nuclear fuel. Although not final, the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999 (see Section 4.12.1 of the EIS), indicates that it is highly probable that sodium-bonded spent nuclear fuel would not be acceptable in the repository without some stabilization and/or removal of the metallic sodium. The stabilization of the spent nuclear fuel and/or removal of the metallic sodium will provide greater protection of human health and the environment. In addition, having completed the Electrometallurgical Treatment Research and Demonstration Project (see Section 1.6.3) and in planning the closure of its PUREX processing capabilities, DOE needs to decide whether this process is suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in the loss of capability and experienced, knowledgeable technical staff should DOE decide at a later date to use the electrometallurgical process to treat sodium-bonded spent nulcear fuel. Section 1.2 of the EIS has been revised for clarification.

41-3: ANL-W is involved in other DOE missions in addition to electrometallurgical treatment. Ongoing activities unrelated to electrometallurgical treatment at ANL-W include long-term waste storage gas generation testing at the Zero Physics Power Reactor; characterization and repackaging of mixed hazardous waste for shipment to the Waste Isolation Pilot Project at the Hot Fuel Examination Facility; conversion of sodium coolant from the EBR-II and Fermi reactors to chemically inert low-level radioactive waste in the sodium process facility; and deactivation of the EBR-II facility. The number of jobs affected by the electrometallurgical treatment alternative at ANL-W is presented in Section 4.2.3 of the EIS.

41-4: Final test results were made available in August 1999 and were used in the EIS. The success criteria established at the outset of the project were fulfilled. The environmental impact analysis associated with the

Commentor No. 41: Steve Hopkins (Cont'd)

FROM : FAX NO. : Sep. 28 1999 01:50PM P2

meaningful research to determine the effectiveness of pyroprocessing and thus the advisability of expanding the project. Now the DOE is moving forward with the EIS on expansion long before Argonne's demonstration project results have been analyzed. **41-4**

Key areas of concern about pyroprocessing for both the public and Congress have always been its cost and its impact on US nonproliferation efforts. Though these separate documents were released during the public comment period, they were not initially available along side the DEIS, and having them as separate documents makes it harder for the public to review all the impacts associated with the various proposed treatments. The Alliance was told these documents would be mailed out on August 9th, however they were not made available to us until the Boise hearing on August 24th. Initially, this gave us only three weeks to review the documents, incorporate that information into information gathered from the DEIS, and pass the information onto our members. That is not nearly enough time and again speaks to the haste with which this process is proceeding. **41-5**

Short-circuiting the nonproliferation analysis is particularly egregious in light of the pledge in the Notice of Intent to include this assessment in the draft EIS and the existence of such a DOE assessment from December 1998.

In 1994, then-DOE secretary Hazel O'leary asked Congress to stop funding the IFR. "Because it is based on plutonium reprocessing and recycle, continued development of the Integral Fast Reactor would undercut our efforts to discourage other countries from plutonium reprocessing and recycle." **Pyroprocessing represents the reprocessing component of the IFR program.** The fact that this technology could be, according to the DOE's recent non-proliferation assessment, at least perceived by other countries as a reprocessing technology for weapons material is compounded by INEEL's historical reprocessing role related to weapons production and the current on-site presence of plutonium and uranium suitable for bombs. **41-6**

The National Academy of Science has regularly evaluated the pyroprocessing demonstration project, which has increased the scientific integrity of Argonne's project. But the NAS final report on pyroprocessing will not be complete until well after the EIS public comment period has ended, hampering both the public's ability to comment and Argonne's ability to evaluate its own work. **41-7**

In 1995, Sandia National Laboratories recommended that "**...most decisions on** [spent fuel] **treatment or conditioning should wait until a repository type and site are known**" [bold italics in original]. Many observers, including the NAS, have repeatedly raised the issue of uncertainty vis a vis the waste forms that pyroprocessing will produce and their acceptability at a geologic repository. Since getting waste ready for a geologic repository is the justification for Argonne's project, it must not go forward until the waste produced by the demonstration project has been fully characterized, which will occur early in the next century. The necessity for this is made more apparent by indications that Argonne is still adjusting the pyroprocessing waste forms. **41-8**

Response to Commentor No. 41 (Cont'd):

electrometallurgical process alternatives was based on actual data from the project. Section 1.6.3 of the EIS summarizes the status and the results of the project.

41-5: In response to comments received during the scoping period, DOE expedited completion of the Cost Study and the Nonproliferation Impacts Assessment. These reports were mailed to interested parties on August 12, 1999, and also were made available to attendees at the public hearings on the draft EIS, which were held August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho; and August 31, 1999, in Arlington, Virginia. NEPA does not require inclusion of the information presented in these documents in the EIS; however, it will be considered along with other pertinent data when the Record of Decision is prepared. DOE extended the comment period from September 13 to September 28, 1999 (64 FR 49169) to provide commentors with an additional two weeks to review the draft EIS and associated documents and to pass the information on to other interested parties.

41-6: Although the Nonproliferation Impacts Assessment is not part of the EIS process, it fully analyzes the potential nonproliferation impacts of each of the proposed alternatives and technologies addressed in the EIS. The Notice of Intent to prepare the EIS stated, "The combination of the information contained in the draft EIS, the public comments in response to the draft EIS, and the Nonproliferation Impacts Assessment will enable the Department to make a sound decision…." As stated in the Nonproliferation Impacts Assessment, the alternatives involving PUREX reprocessing and broad application of electrometallurgical treatment of both driver and blanket fuel have a greater potential to provide encouragement to other countries to engage in plutonium reprocessing. Given the small quantity and unique characteristics of the sodium-bonded spent nuclear fuel and the reason for its treatment, however, such encouragement, if any, would be limited. The proposed use of electrometallurgical treatment technology would not add to the stockpile of weapons-usable fissile materials.

41-7: While the final report on the Electrometallurgical Treatment Research and Demonstration Project from the National Academy of Science's National Research Council was not available to the public during the comment period on the draft EIS, interim status reports were available in the public reading rooms. Thus, the public had an opportunity to review the information made available by the National Research Council prior to making comments on the draft EIS. The final National Research Council report on the

Commentor No. 41: Steve Hopkins (Cont'd)

FROM : FAX NO. : Sep. 28 1999 01:50PM P3

Though the Alliance's confidence in the governor's settlement agreement is not high, it should be noted that, if Idaho's sodium laced and/or bonded spent fuel is not reprocessed, the agreement mandates 2035 as its departure date. If it is reprocessed and therefore becomes high-level waste, there is no departure date in the agreement only a "target date" for road readiness. Argonne therefore has to account for long-term, not interim, storage costs (economic and environmental) at INEEL as well as all other costs associated with its production and disposition. **41-9**

It's worth noting here that the proposed action for the 17 MTHM of EBR2 fuel at Savannah River is not pyroprocessing. **41-10**

The Snake River Alliance has long supported the designation of spent fuel as a waste. The DOE has resisted that course. One result of this is that Argonne's 45% waste reduction argument for pyroprocessing is "off." At the very least, the DOE must account for the low enriched uranium pyroprocessing produces. To say it is a product, not a waste is to ignore the fact that, in the DOE's world, spent fuel is not a waste either. Discussion of the LEU stream must include a full analysis of what happens to this stream and when. **41-11**

In the past, the Alliance has prevailed upon the DOE to include ANL-W as a part of INEEL in environmental analyses. We would now encourage the DOE to consider ANL-W a part of the DOE's complex itself. If this occurs, it would highlight the necessity for coordinating the analysis in the present draft EIS (and the action chosen in the ROD) with the EIS on spent fuel management at Savannah River and the EIS on stabilization of high-level waste at INEEL. The INEEL EIS has particular relevance here. If the two studies (and decisions) are not coordinated, there may well be three high-level waste forms in one Idaho county. Again, analysis of those waste forms requires a full accounting of the economic and environmental costs of long-term management at INEEL. **41-12** **41-9**

Summary:

According to the section on potential facility accidents (pg.4-11), the sodium-bonded fuel ". . . is in a very safe and stable configuration and no reasonable foreseeable accident scenarios could be identified." If the spent fuel in question presented a near term risk to human health and the environment, the Alliance would support an alternative that could best stabilize it to lessen that risk. It is also the case that if a repository were open (and waste acceptance criteria known), and if such a facility was supported by the public through an open and scientifically credible public process, treatment of this fuel could potentially be justified. However, the DOE has not made even a weak case for treating this fuel at this time; there is no current repository for this spent fuel (not even *known* waste acceptance criteria), and there may never be. These facts and our previously related concerns about the issuance of this DEIS before important data are in **lead us to support the no action alternative at this time** in accordance with the ROD for the Programmatic Spent Nuclear Fuel EIS. If a case can be made in the future for treatment of this spent fuel due to risks posed to human health and the environment, we ask the **41-13** **41-14** **41-15**

Response to Commentor No. 41 (Cont'd):

demonstration project at ANL-W was published in April 2000. DOE will consider the data contained in this report in preparing the Record of Decision.

41-8: The process of establishing a repository is dependent on not only the site but also the materials to be disposed of. As part of most of the steps in this process a total system performance assessment that describes the probable behavior of a repository at Yucca Mountain is performed. The total system performance assessment includes the performance of the specific waste forms and inventories proposed for disposal. As part of this work to establish a repository, data for the waste forms are needed prior to final choice of the repository not after it. In fact, if specific waste forms are not represented in crucial documents like this EIS, additional documentation will be needed to allow the possibility of disposing of those materials in the repository. As part of the Electrometallurgical Treatment Research and Demonstration Project, ANL-W has interacted regularly with DOE and have provided conservative waste form data for the EIS.

41-9: This EIS evaluated the environmental impacts from treatment and management of sodium-bonded spent nuclear fuel up to 2035. This date is consistent with the State of Idaho Settlement Agreement and Consent Order that all spent nuclear fuel and high-level radioactive waste be removed from the State of Idaho by 2035. The commentor is correct in stating that the Settlement Agreement and Consent Order only requires the road-readiness of the high-level waste by the target date. Normal operation radiological effluent from potential fuel degradation during storage at INEEL up to 2035 are evaluated under the No Action Alternative in Section 4.2 of the EIS. As discussed in revised Section 2.5.1 of the EIS, a fundamental assumption made under the No Action Alternative is that sodium-bonded spent nuclear fuel would be disposed of in a repository, along with the rest of the DOE-owned spent nuclear fuel, within a finite period of time and under the institutional control of DOE. This SBSNF EIS covers a time period up to 2035, at which time sodium-bonded spent nuclear fuel stored in Idaho would need to be transported out of the state and either stored or treated at another DOE site. For such an eventuality, additional NEPA documentation would be required. The unlikely scenario that treated sodium-bonded spent nuclear fuel remains at its current site beyond 2035 because there is no geologic repository to accept it was evaluated as part of the No Action Alternative in Yucca Mountain Draft EIS, which was issued by DOE in July 1999. The Yucca Mountain EIS is discussed in Section 1.6.2.2.

41-10: EBR-II fuel currently located at SRS is declad blanket spent nuclear fuel that has been cleaned of sodium and placed in aluminum cans. This fuel is

Commentor No. 41: Steve Hopkins (Cont'd)

FROM : FAX NO. : Sep. 28 1999 01:51PM

DOE to reissue a Draft EIS incorporating the aforementioned information yet to be gathered, including a new nonproliferation assessment that assumes a more realistic view of pyroprocessing as a reprocessing technology. 41-15 (cont'd)

Again, thank you for the opportunity to comment on the draft EIS and for the deadline extension.

Respectfully submitted,

Steve Hopkins
Program Assistant
Snake River Alliance

Response to Commentor No. 41 (Cont'd):

not part of the sodium-bonded spent nuclear fuel considered in this EIS.

41-11: Section 4.1.2 and Section C.1 of Appendix C of the EIS describes the low enriched uranium product that would result from electrometallurgical treatment of sodium-bonded blanket spent nuclear fuel. After electrometallurgically treating the sodium-bonded spent nuclear fuel, metal ingots containing either low enriched or depleted uranium would be stored in the Materials Building within the Zero Power Physics Reactor at ANL-W, pending DOE's decision regarding final disposition of this uranium. Final disposition of the uranium product from electrometallurgical treatment is not within the scope of this EIS. DOE plans to conduct a separate NEPA review that will evaluate the disposition of surplus uranium.

41-12: As stated in the introduction, this SBSNF EIS follows the June 1995 Record of Decision (60 FR 28680) for DOE's Programmatic Spent Nuclear Fuel EIS, in which DOE decided to regionalize spent nuclear fuel management by fuel type for DOE-owned spent nuclear fuel. DOE also decided to: (1) continue environmental restoration activities at INEEL; (2) develop cost-effective treatment technologies for spent nuclear fuel and waste management; and (3) implement projects and facilities to prepare waste and treat spent nuclear fuel for interim storage and final disposition. The Record of Decision for the Programmatic Spent Nuclear Fuel EIS (60 FR 28680) provides the programmatic umbrella for the site-specific actions addressed in the EISs identified by the commentor, the SBSNF EIS, the Savannah River Spent Nuclear Fuel Management EIS, and the Idaho High-Level Waste and Facilities Disposition Draft EIS. As tiered NEPA documents, these EISs analyze the site-specific environmental impacts of implementing the actions proposed in each. The Savannah River Spent Nuclear Management Fuel EIS evaluates the impacts from the treatment of aluminum-clad and other spent nuclear fuel designated for treatment at SRS. The Idaho High-Level Waste and Facilities Disposition Draft EIS evaluates the impacts from processing specific amounts of calcined and sodium-bearing, high-level radioactive waste material currently located at INEEL. The materials (spent nuclear fuel and high-level radioactive waste) addressed in these EISs have unique characteristics and requirements which necessitate their separate evaluation. Each of the EISs identified by the commentor was incorporated by reference and used, as appropriate, in this SBSNF EIS. The contributory effects of these other ongoing NEPA actions at INEEL and SRS are evaluated as part of the cumulative impacts analysis for those sites (see Section 4.11 in the SBSNF EIS). The cumulative effect of the number and volume of high-level waste forms that could be located at INEEL is addressed

Commentor No. 41: Steve Hopkins

Response to Commentor No. 41 (Cont'd):

in Section 4.11.1.6 of the SBSNF EIS. DOE, in their Record of Decision, takes into account many factors besides this EIS, including ongoing DOE programs, missions, and related NEPA actions that have relevance (see Section 1.6 in the SBSNF EIS).

41-13: The timing for this action is a programmatic issue rather than a safety issue. As stated in Section 1.2 of the EIS, DOE considers it prudent to evaluate the alternative technologies now, while DOE is performing site characterization activities for the potential repository at Yucca Mountain. Although not final, the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999 (see Section 4.12.1 of the EIS), indicates that it is highly probable that sodium-bonded spent nuclear fuel would not be acceptable in the repository without some stabilization and/or removal of the metallic sodium. The stabilization of the spent nuclear fuel and/or removal of the metallic sodium will provide greater protection of human health and the environment. Having completed the Electrometallurgical Treatment Research and Demonstration Project (see Section 1.6.3) and in planning the closure of its PUREX processing capabilities, DOE needs to decide whether these processes are suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in the loss of capability and of experienced, knowledgeable technical staff should DOE decide at a later date to use the electrometallurgical process to treat the sodium-bonded spent nuclear fuel. Section 1.2 of the EIS has been revised for clarification.

41-14: The commentor's support for a No Action Alternative, under which the only activities taking place concerning sodium-bonded spent nuclear fuel would be those dictated by the Record of Decision for the Programmatic Spent Nuclear Fuel EIS, is noted.

41-15: As stated in the Nonproliferation Impacts Assessment, DOE's Office of Arms Control and Nonproliferation has determined that, for this specific application, electrometallurgical treatment of this spent nuclear fuel is fully consistent with U.S. policy with respect to reprocessing and nonproliferation since it does not separate plutonium for reuse. Plutonium would be part of the ceramic waste form, which is more resistant to plutonium recovery than metallic waste forms such as those resulting from the melt and dilute and high-integrity can alternatives.

Commentor No. 42: Margaret Macdonald Stewart

_____Forward Header_____

Subject: Comments on DEIS on treatment and mgmt of sodium-bonded spent nuclear fuel
Author: mstewart@snakeriveralliance.org at INTERNET
Date: 9/28/99 2:55 PM

COMMENTS BY MARGARET MACDONALD STEWART ON DRAFT EIS FOR TREATMENT AND MANAGEMENT OF SODIUM-BONDED SPENT NUCLEAR FUEL

Attention: Sue Lesica 28 September 1999
NEPA Document Manager
Office of Nuclear Facilities Management
Department of Energy

The following are but a few of the comments I have to make on the Draft EIS on Treatment and Management of Sodium-Bonded Spent Nuclear Fuel:

To begin with, this DEIS is a very typical DOE document in that it is a magnificent example of "cart before the horse" mentality. The public is being asked to make comments on a document that is inadequate and is based on yet-unknown criteria. In order for people to make informed and intelligent comments, it would therefore make sense to allow them access to all pertinent information upon which to base those comments. **42-1**

The comment period extension was not adequate. A 15-day extension is almost a joke considering the information made available by DOE is still not adequate. This extension period is a flimsy ploy to placate a public that has not been given all the information it needs to comment. **42-2**

The DEIS is incomplete for the following reasons and more:

Where is the National Academy of Science's review of the proposed treatment? **42-3**

The cost analysis of various alternative treatment methods is missing. **42-4**

This entire document is based on transporting the pyroprocessing waste to Yucca Mountain. The Yucca Mountain EIS has not yet been released and no one knows the waste acceptance criteria. It could well end up that the pyro waste would be unacceptable for Yucca Mountain storage. What would be the end scenario in such an event? **42-5**

I have not received a copy of the recently released DOE nuclear weapons proliferation assessment. Why? Has it really been released? How do I get a copy, since I receive nearly everything DOE ever prints? **42-6**

Response to Commentor No. 42:

42-1: DOE has made every effort to obtain and analyze all of the information it needs to make a decision on the treatment and management of its sodium-bonded spent nuclear fuel. DOE has analyzed input from the public (during the public scoping and comment periods on the draft EIS), as well as from Federal and state agencies and local and Tribal governments. It has also reviewed site-specific information on the environmental conditions prevailing at ANL-W, INEEL, and SRS, as well as documentation related to each of the proposed treatment technologies. DOE made material supporting the preparation of the EIS available in public reading rooms and at a series of public hearings that were advertised in the Federal Register, as well as local newspapers. In addition, completion of the Cost Study and Nonproliferation Impacts Assessment was expedited so that they would be available to the public during the comment period. These reports were mailed to interested parties on August 12, 1999, and were made available to attendees at all of the public hearings on the draft EIS, which were held August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho; and August 31, 1999, in Arlington, Virginia. While the final National Research Council report on the demonstration project at ANL-W was published in April 2000, interim status reports were produced throughout the project and are available in the public reading rooms. Considering the additional time provided by the extension of the comment period and the availability of the data used to prepare the EIS, DOE does not believe that a second draft is warranted.

42-2: The original comment period on the draft EIS was set at 45 days in compliance with the Council on Environmental Quality's "Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act" (40 CFR 1506.10(c)). In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169). The extension of the comment period reflects DOE's commitment to the NEPA process by ensuring that the public had more time to review the EIS than the 45-day period required by Council on Environmental Quality guidelines.

42-3: The National Academy of Sciences' National Research Council prepared interim status reports on the results of the Electrometallurgical Treatment Research and Demonstration Project that have been reviewed by DOE. All of these reports are available in DOE public reading rooms. The National Research Council completed their evaluation of the electrometallurgical

Commentor No. 42: Margaret Macdonald Stewart (Cont'd)

The test or demonstration project on the proposed treatment of this sodium-bonded spent nuclear fuel being done at Argonne-West will not be completed with results available until the end of September at the earliest. How can the public comment on this proposed treatment without the results of this critical demo project??

42-7

I respectfully request that the DOE complete all the necessary documentation and resubmit a second DEIS on this subject, when it has included ALL the information necessary for the public to make informed and accurate comments. With only the information made available in this inadequate DEIS, it is obvious that DOE has already made up its mind on the preferred alternative, and this leaves the public - once again - feeling they have been left out of the democratic process when it comes to decisions made by DOE. A very poor attempt that needs to be redone.

42-8

42-9

42-8

Sincerely,

Margaret Macdonald Stewart
Box 4090
Ketchum, ID 83340

Response to Commentor No. 42 (Cont'd):

treatment demonstration project in September 1999 and published their final summary report in April 2000. The final report findings will be considered during the decision-making process leading to the Record of Decision.

42-4: The SBSNF EIS was prepared in accordance with NEPA, Council on Environmental Quality regulations on implementing NEPA (40 CFR 1500-1508), and DOE's NEPA implementation procedures (10 CFR 1021). None of these require the inclusion of a cost analysis in an EIS. As discussed in the introduction, the basic objective of this EIS is to provide the public and DOE decision-makers with a description of the reasonable alternatives for the treatment and management of DOE's sodium-bonded spent nuclear fuel and their potential environmental impacts. However, DOE issued a separate Cost Study on August 12, 1999, that analyzes and compares the costs of the alternatives analyzed in the EIS. Cost will be considered during the decision-making process in preparing the Record of Decision.

42-5: As discussed in Section 2.7 of this EIS, final waste acceptance criteria are still being developed for a geologic repository. DOE expects the waste forms that would be produced by the proposed action would be suitable for disposal in a geologic repository. In July 1999, DOE published a Draft Yucca Mountain EIS, which is discussed in Section 1.6.2.2 of this EIS. The Yucca Mountain EIS assumes that sodium-bonded spent nuclear fuel is treated using the electrometallurgical process prior to emplacement in the repository.

42-6: The Nonproliferation Impacts Assessment was mailed to those persons on the SBSNF EIS mailing list on August 12, 1999. It was also made available to attendees at the public hearings on the draft EIS, which were held August 17, 1999, in North Augusta, South Carolina; August 24, 1999, in Boise, Idaho; August 26, 1999, in Idaho Falls, Idaho; and August 1, 1999, in Arlington, Virginia. A copy of the report has been forwarded to the commentor.

42-7: Final test results were made available in August 1999 and were used in the EIS. The success criteria established at the outset of the project were fulfilled. The environmental impact analysis associated with the electrometallurgical process alternatives was based on actual data from the project. Section 1.6.3 of the EIS summarizes the status and the results of the project.

42-8: DOE has made material supporting the preparation of the EIS available in public reading rooms and through a series of public hearings which were advertised in the Federal Register, as well as local newspapers. In addition,

Commentor No. 42: Margaret Macdonald Stewart

Response to Commentor No. 42 (Cont'd):

completion of the Cost Study and Nonproliferation Impacts Assessment was expedited so that these would be available to the public during the comment period. These reports were mailed to interested parties on August 12, 1999, and were made available to attendees at all of the public hearings on the draft EIS. While the final National Research Council report on the Electrometallurgical Treatment Research and Demonstration Project at ANL-W was published in April 2000, interim status reports have been produced throughout the project and these are available in the public reading rooms. Considering the additional time provided by the extension of the comment period and the availability of the data used to prepare the EIS, DOE does not feel that a second draft is warranted.

42-9: The NEPA process provides a number of opportunities for the public to participate in the preparation of an EIS. For example, the public had the opportunity to attend scoping meetings and public hearings on the draft EIS, at which time they could make comments and speak directly to DOE and ANL personnel. These meetings were held in North Augusta, South Carolina; Boise, Idaho; Idaho Falls, Idaho; and Arlington, Virginia. The public also had the opportunity to comment on the EIS through the U.S. mail, e-mail, a toll-free FAX number, and a toll-free phone number. DOE takes this participation seriously. For example, DOE made a number of changes in the draft EIS in response to comments received during the scoping meetings, including dropping electrometallurgical treatment of sodium-bonded spent nuclear fuel at ANL-W as the Preferred Alternative from the beginning of the EIS process. In preparing the final EIS, DOE also carefully considered all comments received from the public. Thus, the public was not left out of the NEPA process for preparing this EIS.

Commentor No. 43: Willie R. Taylor

United States Department of the Interior

OFFICE OF THE SECRETARY
Washington, D.C. 20240

SEP 7 1999

In Reply Refer To:
ER 99/637

Ms. Susan Lesica
Document Manager
Office of Nuclear Facilities Management (NE-40)
Office of Nuclear Energy, Science, and Technology
U. S. Department of Energy
19901 Germantown Road
Germantown, MD 20874-1290

Dear Ms. Lesica:

The United States Department of the Interior (Department) has reviewed the draft environmental impact statement (DEIS) for the treatment and management of sodium-bonded spent nuclear fuel and offers the following comments.

General Comments

From review of the DEIS it is unclear if the proposed treatment and storage of sodium-bonded spent nuclear fuel at the Savannah River Site will represent a substantial risk to Departmental trust resources. The analysis reveals that all alternatives will impact air quality and at least one of the alternatives will impact water resources. It has also accordingly been shown that ecological receptors occur within the affected environment. However, the document does not address potential impacts to these resources in the discussion of environmental consequences. We suggest that further revisions of the EIS reflect that appropriate consideration was given to both the human and ecological environments. **43-1**

Specific Comments

Section 2.10.2 -The second sentence of the second paragraph, states the radiological and nonradiological gaseous and liquid effluents, as well as the associated exposures to workers and the public, are well below regulatory standards and guidelines. However, these referenced standards and guidelines are not clearly represented in the document. It would be helpful if they were incorporated into *Table 2-4 Summary of Environmental Consequences for the Treatment and Management of Sodium-bonded Spent Nuclear Fuel* in the revised EIS. **43-2**

Section 4.4.4.1. - In the last paragraph of this section there is a typo which references a section of the text that does not exist, 3.2.12.2. We believe that the proper section identifier is 3.2.10.2. **43-3**

Response to Commentor No. 43:

43-1: As stated in Section 4.1.1, no radiological damage to plant and animal populations would be expected as the result of the proposed action because the estimated doses to the human population are well below threshold values for which effects to plants and animals would be expected. The EIS also identifies chemical releases to the air and water resources at SRS. These releases are essentially independent of the fuel being processed. They are generated from the operations of various facilities. The quantities of releases attributable to treatment of the fuel in this EIS are a very small fraction of the current releases at the site. Recent site environmental reports (years 1996-1998) did not identify any measurable impacts on plants and animals because the amounts emitted are very low or the chemicals have little potential for causing negative effects. Therefore, no chemical damage to plant and animal populations are expected to result from treatment of the fuel, as explained in this EIS.

43-2: Regulatory limits and guidelines for radiological and nonradiological effluent and associated exposures to workers and members of the public are presented in Section 4.1.3 and Appendix E of the EIS. Appropriate footnotes have been added to Table 2-4.

43-3: The commentor is correct. The section numbering cited by the commentor has been revised.

Commentor No. 43: Willie R. Taylor (Cont'd)

Section 4.10.2.1 - Assessment of impacts to air resources from nonradiological and radiological air pollutants is limited to concentrations at the site boundary. Many fish and wildlife resources, and possibly humans, will likely be exposed to air pollutants within the site boundary. Therefore, it is likely that impacts from air pollutants have been underestimated for wildlife populations occurring within the site boundary. **43-4**

The Department appreciates the opportunity to review the DEIS. We hope our comments will be useful in your evaluation of various alternatives for this project. We will be happy to provide any further assistance that you may need.

Sincerely,

Willie R. Taylor
Director
Office of Environmental Policy
and Compliance

Response to Commentor No. 43 (Cont'd):

43-4: Site annual environmental reports monitor conditions within the site boundaries at SRS and INEEL and have not identified any measurable impacts on fish and wildlife resources. Releases and emissions as a result of the proposed action are a small fraction of the current releases and emissions from each site. Therefore, no impacts to ecological resources are expected to occur from the incremental contribution to cumulative impacts at SRS or INEEL from the treatment and management of sodium-bonded spent nuclear fuel.

Commentor No. 44: Kathryn Graves

Kathryn Graves
Box 4185
Hailey, ID 83333

Ms Susan Lesica
US Dept Energy
Office of Nuclear Facilities Mgt., NE-40
19901 Germantown Rd.
German town, Maryland
20874-1290

September 7, 1999

To whom it may concern:

I would like to comment on the "Draft Environmental Impact statement for the Treatment and Management of Sodium-Bonded spent Nuclear fuel."

I think there are several things wrong with pyroprocessing

Firstly, it separates out bomb-grade uranium. Isn't that counterproductive to our nonproliferation goals? **44-1**

Secondly, this will create new forms of nuclear waste. We have thirty to forty years worth of nuclear waste here at INEEL That we don't know what to do with. **44-2**

Thirdly, There are great waste/storage/and Cleanup problems at INEEL that need to be dealt w/ first. **44-3**

Please note that I am against pyroprocessing. And I am also requesting a 60-day extension of the comment period. **44-4**

Sincerely,

Response to Commentor No. 44:

44-1: The assessment of nonproliferation impacts is not a part of the EIS process. None of the alternatives analyzed in this EIS would generate weapons-usable fissile materials at INEEL. Although highly enriched uranium would be an interim product, it would be down-blended to low enriched uranium during electrometallurgical treatment.

44-2: Electrometallurgical treatment (pyroprocessing) has been evaluated and successfully demonstrated in a three-year program at ANL-W that was continuously reviewed by a National Academy of Sciences' National Research Council Committee that concluded that electrometallurgical treatment is a feasible process for treating sodium-bonded spent nuclear fuel. All of the alternatives evaluated in this EIS would produce some forms of high-level radioactive waste. The electrometallurgical treatment alternative produces two new waste forms, both of which are more stable than nontreated sodium-bonded spent nuclear fuel. DOE is confident that these new waste forms will be acceptable for emplacement in a geologic repository. All waste, storage, and cleanup problems are being addressed in parallel with the SBSNF EIS. Other EISs that have been or are expected to be issued evaluate radioactive waste, and spent nuclear fuel at INEEL.

44-3: The commentor's objection to electrometallurgical treatment (pyroprocessing) of sodium-bonded spent nuclear fuel is noted.

44-4: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

Commentor No. 45: Marlise A. Teasley

Sept 2-99

Ms. Susan Stiles
US DOE
Office of Nuclear Facilities Mgt. NE40
19901 Germantown Road
Germantown, Maryland 20874-1290

Dear Ms. Stiles:

I am a native Idahoan who has followed as closely as I could the many problems at the INEEL for the past 15 years.

I have visited the site two times and thus, have some idea of the magnitude of the waste management problems created in the past which are compounded by the continuing use of this already overburdened facility as a "waste dump."

Because of the lack of visible information regarding the feasibility of pyroprocessing, the cost, the potential "fallout" regarding those

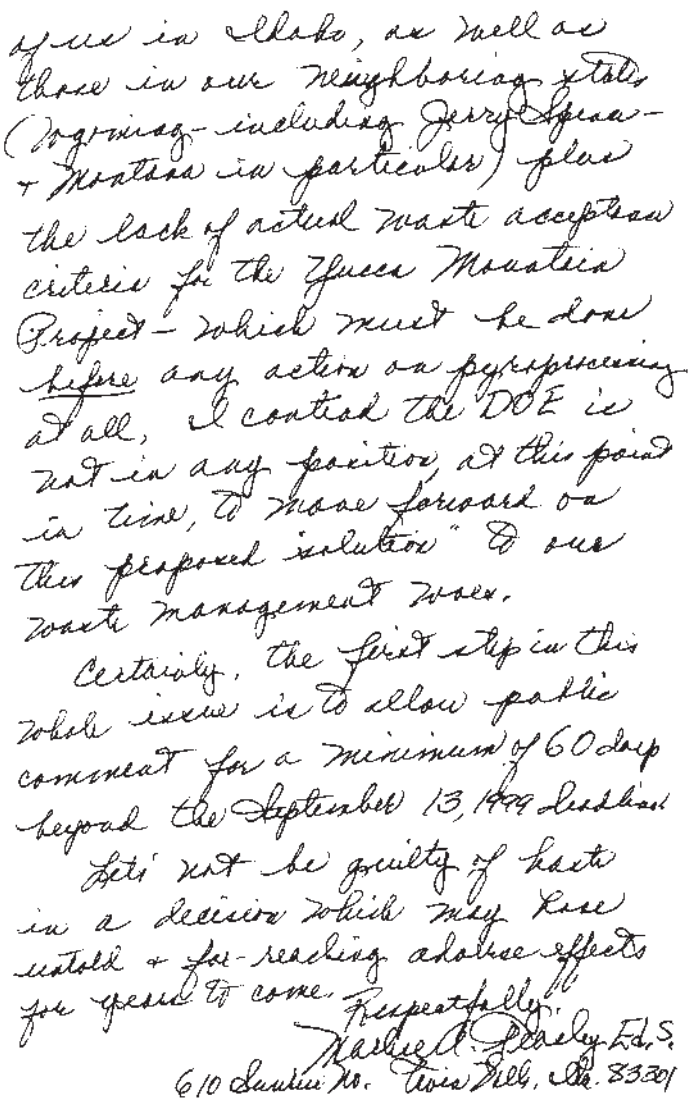
45-1

45-2

Response to Commentor No. 45:

45-1: DOE is committed to improving its environmental management practices, to operating its facilities in a manner that meets or exceeds all applicable environmental, safety, and health requirements, and to the cleanup of its environmental problems. DOE has a very aggressive cleanup program and has worked with the EPA, states, and stakeholders to develop long-range programs and commitments to clean up its facilities to acceptable levels. As stated in the introduction to this EIS, DOE proposes to treat the sodium-bonded spent nuclear fuel and facilitate its ultimate disposal in a geologic repository outside the State of Idaho. While the commentor's opinion about INEEL is noted, this comment is beyond the scope of the SBSNF EIS. The focus of the SBSNF EIS is to assess the potential environmental and health impacts associated with the treatment and management of sodium-bonded spent nuclear fuel.

45-2: As stated in the introduction to the SBSNF EIS, the programmatic risk in implementing any of the potential alternatives for the treatment and management of sodium-bonded spent nuclear fuel, or of not treating this fuel, is the uncertainty surrounding the acceptability of DOE spent nuclear fuel for emplacement in a potential geologic repository. Although not final, the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999 (see Section 4.12.1 of the EIS), indicates it is highly probable that sodium-bonded spent nuclear fuel would not be acceptable in the repository without some stabilization and/or removal of the metallic sodium. The stabilization of the spent nuclear fuel and/or removal of the metallic sodium will provide greater protection of human health and the environment. Having completed the Electrometallurgical Treatment Research and Demonstration Project (see Section 1.6.3), and in planning the closure of its PUREX processing capabilities, DOE needs to decide whether these processes are suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in a loss of capability and of experienced, knowledgeable technical staff should DOE decide at a later date to use the electrometallurgical process to treat sodium-bonded spent nuclear fuel. Section 1.2 of the EIS has been revised for clarification.



your in Idaho, as well as those in our neighboring states (Wyoming - including Jerry Sprague + Montana in particular) plus the lack of actual waste acceptance criteria for the Yucca Mountain Project - which must be done before any action on preprocessing at all, I contend the DOE is not in any position, at this point in time, to move forward on this proposed solution to our waste management woes.

Certainly, the first step in this whole issue is to allow public comment for a minimum of 60 days beyond the September 13, 1999 deadline.

Let's not be guilty of haste in a decision which may have untold + far-reaching adverse effects for years to come.

Respectfully,
Marlise A. Teasley Ed.S.
610 Sunrise No. Twin Falls, Ida. 83301

45-2 (cont'd)

45-3

45-2

45-3: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13 to September 28, 1999 (64 FR 49169).

Commentor No. 46: H. Zerriffi & L. Ledwidge

Sept. 29, 1999

To: Susan Jessica, NE-40
Fr: Lisa Ledwidge
cc: Hisham Zerriffi

Attached please find an UPDATED VERSION of IEER's comments on
the Draft
Environmental Impact Statement for the Treatment and Management
of
Sodium-Bonded Spent Nuclear Fuel.

We noticed a slight grammatical error on the version that was
emailed to
you yesterday (from Hisham Zerriffi). Please replace that
version with the
one herein.

Thank you very much.

Lisa Ledwidge
Outreach Coordinator and Editor, Science for Democratic Action
Institute for Energy and Environmental Research (IEER)
6935 Laurel Ave., Suite 204
Takoma Park, MD 20912 USA
(301) 270-5500 fax: (301) 270-3029
http://www.ieer.org

SBSNFCOM.DOC

Response to Commentor No. 46:

Commentor No. 46: H. Zerriffi & L. Ledwidge (Cont'd)

INSTITUTE FOR ENERGY AND ENVIRONMENTAL RESEARCH

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http://www.ieer.org

Comments of the Institute for Energy and Environmental Research (IEER) on the *Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel* (DOE/EIS-0306D)

Hisham Zerriffi, Project Scientist
Lisa Ledwidge, Outreach Coordinator
9/28/1999

The Department of Energy (DOE) has once again released a Draft Environmental Impact Statement which demonstrates its willingness to sacrifice environmental protection and nonproliferation in order to pursue its programmatic goals. The *Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel* (DOE/EIS-0306D, hereinafter referred to as DEIS) analyzes options for processing spent nuclear fuel which is contaminated with metallic sodium. With the exception of the "No Action Alternative" all six alternatives involve processing the spent fuel in such a way as to have serious repercussions on the proliferation of plutonium. **46-1**

What is worse is that this document makes it clear that the DOE wants to undertake a proliferation risky program under the guise of Environmental Management. And, to make matters even worse, one of the technologies being proposed is responsible for a significant portion of the Energy Department's environmental management problems. PUREX is a technology which for decades has separated plutonium for use in nuclear weapons and created extensive environmental problems and safety risks in both Washington and South Carolina. There are currently millions of gallons of liquid radioactive waste from PUREX operations threatening both the Columbia River and the Savannah River. **46-2**

The Energy Department proposes six alternatives for treating spent nuclear fuel contaminated with reactive metal sodium. The fuel is the result of the research program attempting to develop liquid metal fast breeder nuclear reactors. These used liquid metal sodium as a coolant.[1] The spent fuel consists mainly of two types: driver (used to maintain the chain reaction in the core) and blanket (used to breed plutonium-239). During irradiation, some of the metallic sodium enters and mixes with both the fuel and outer cladding (in the case of the driver fuel) or mixes with the outer cladding (in the case

[1] See Arjun Makhijani and Scott Saleska, *The Nuclear Power Deception: U.S. Nuclear Mythology From Electricity "Too Cheap to Meter" to "Inherently safe" Reactors*. (New York: Apex Press, 1999) for a description of fast breeder reactors and an explanation of why metallic sodium was used as a coolant.

Response to Commentor No. 46 (Cont'd):

46-1: Although the assessment of nonproliferation impacts is not part of the EIS process, DOE's Office of Arms Control and Nonproliferation assessed the potential nonproliferation impacts that may result from each of the proposed alternatives and technologies analyzed in this EIS. The report stated that, for this specific application, all of the alternatives except PUREX processing at SRS are fully consistent with U.S. policy on reprocessing and nonproliferation. Alternative 3, PUREX processing, is the only alternative that would generate weapons-usable fissile material, including plutonium. This plutonium would be managed along with other surplus plutonium, as described in the Surplus Plutonium Disposition EIS.

46-2: As described in Section 2.5.4 of the EIS, DOE is considering PUREX processing at F-Canyon as one of the alternatives for treatment and management of the sodium-bonded spent nuclear fuel. This process, as explained in Section 4.5.6, would produce liquid high-level and low-level radioactive waste. The liquid high-level radioactive waste would be vitrified at the Defense Waste Processing Facility and transformed to a borosilicate glass waste form in preparation for disposal in a geological repository. DOE has evaluated the impacts from current and future liquid waste storage and processing in the Defense Waste Processing Facility EIS and its Supplement (DOE/EIS-0082 and DOE/EIS-0082-S), as well as the Interim Management of Nuclear Material EIS (DOE/EIS-0220). Section 3.3.4.1 of this EIS and annual SRS environmental reports provide descriptions of current water quality conditions in the Savannah River at SRS. The liquid radiological effluent from PUREX treatment of declad and cleaned blanket spent nuclear fuel in F-Canyon would not exceed current operating parameters. The impacts of processing the liquid radioactive waste currently stored at the Hanford, Washington, site are beyond the scope of this EIS.

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of blanket fuel). (p. 2-1 – 2-3) Of the 60 metric tons of sodium-bonded spent fuel, 57 metric tons is blanket fuel which can have the sodium removed through a method which does not process the fuel element itself (other than to remove the outer cladding).[2]

It is necessary to begin by noting the fact that this action is premature. The DEIS identifies no immediate environmental or health concerns for this action. Rather, the Purpose and Need for Action is because "[T]he presence of metallic sodium in the sodium-bonded spent nuclear fuel could complicate the disposal certification and licensing for the ultimate disposal of this spent nuclear fuel in a geologic repository." (p.1-3) This is because metallic sodium can react violently under certain conditions, including a possibility of spontaneous ignition. These reactions produce "heat, potentially explosive hydrogen gas, and sodium hydroxide, a corrosive substance." (p. 1-3) However, these concerns relate to the long-term management of this spent fuel. As is indicated in the "No Action Alternative" it is possible to undertake some stabilization activities to prevent immediate degradation while other alternatives are developed.

The DEIS goes on to state that pure plutonium metal and pure uranium metal are also reactive and the "waste acceptance criteria probably will exclude reactive materials unless their packaging minimizes the probability of rapid oxidation." (p. 1-3) Finally, the DEIS notes that some of the fuel contains HEU which "may require special criticality control measures." (p. 1-3) **46-3**

However, some very obvious facts concerning the purported "Need for Action" call into question both the need and timing of this action.

- There is no pressing need for this action in order to address immediate safety, environmental or health problems. This needs to be clearly stated in the "Purpose and Need for Action" section of the final Environmental Impact Statement. What is at issue is the "disposal certification and licensing for the ultimate disposal of this spent fuel in a geologic repository." (1-3) The spent fuel can be managed with better storage after some minimal preparation.
- There is no guarantee that Yucca Mountain will be selected as the high-level waste repository. Considerable technical controversy over its suitability still remains. **46-4**
- Even if Yucca Mountain is chosen, the final waste acceptance criteria have not yet been established and the DEIS itself states that there is a programmatic risk that the final waste forms will not meet the criteria. (1-1) The argument in the DEIS that potential waste forms should be developed in parallel with the repository is inconsistent with the fact that processing would start in the Year 2000. This is five years before the estimated time for receiving a construction permit from the Nuclear Regulatory Commission, a necessary step in developing final waste form criteria. The DOE is proposing to actually process this spent fuel, not develop "potential waste **46-5** **46-6**

[2] All six alternatives involve processing of at least a portion of the spent fuel. Five of the six alternatives would use a process called Electrometallurgical Treatment (EMT) at Argonne National Laboratory – West at the Idaho National Engineering and Environmental Laboratory in Idaho. This process, a subset of a reprocessing technology called pyro-processing, entails significant proliferation risks which are discussed below. Additionally, one of the options would use the traditional PUREX reprocessing technology at the Savannah River Site in South Carolina for a portion of the fuel.

Response to Commentor No. 46 (Cont'd):

46-3: The timing for this action is a programmatic issue rather than a safety issue. As stated in Section 1.2 of the SBSNF EIS, DOE considers that it is prudent to evaluate the alternative technologies now, while DOE is performing site characterization activities for the potential repository at Yucca Mountain. Although not final, the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999 (see Section 4.12.1 of the EIS), indicates that there is a high probability that sodium-bonded spent nuclear fuel would not be acceptable in the repository without some stabilization and/or removal of the metallic sodium. The stabilization of the spent nuclear fuel and/or removal of the metallic sodium will provide for a greater protection of human health and the environment. Having completed the Electrometallurgical Treatment Research and Demonstration Project (see Section 1.6.3) and in planning the closure of the PUREX processing capabilities, DOE now needs to decide whether these processes are suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in the loss of capability and experienced, knowledgeable technical staff should DOE decide at a later date, to use the electrometallurgical process to treat sodium-bonded spent nuclear fuel. Section 1.2 of the EIS has been revised for clarification.

46-4: The commentor's support for continued storage is noted. The SBSNF EIS does not assume that Yucca Mountain will be selected as the high-level waste repository. It only assumes that, at some time in the future, a geologic waste repository will be licensed and operated by DOE which would receive spent nuclear fuel and high-level radioactive waste.

46-5: See response to comment 46-3.

46-6: DOE acknowledges the commentors' support of the No Action Alternative. As stated in the introduction to the EIS, the programmatic risk in implementing any of the potential alternatives for the treatment and management of sodium-bonded spent nuclear fuel, or of not treating this fuel, is the uncertainty surrounding the acceptability of DOE spent nuclear fuel for placement in a potential geologic repository. (See response to comment 46-3.) The development of waste forms in parallel with the development of the repository is one of many considerations discussed in Section 1.2 (Purpose and Need for Action) of the EIS. The primary

forms." Therefore, these are not parallel processes, but rather sequential processes undertaken in the wrong order. **46-6 (cont'd)**

- There are no immediate time constraints posed by the State of Idaho Settlement Agreement since it does not require spent fuel to be removed until 2035 and the longest processing time listed in the DEIS is 13 years. **46-7**
- Of the 60 MT of spent fuel, 57 MT can have the sodium removed without any of the processing listed in the DEIS through the high temperature cleaning process described in Section 2.4.9. This fact should be made much clearer in the DEIS. It should also note that the uranium in this 57 MT is not HEU. Therefore, if the final waste acceptance criteria require sodium removal, it would only apply to 3 MT of fuel. **46-8**
- The DEIS does not mention the fact that there is significantly more HEU in naval spent nuclear fuel slated to go to Yucca Mountain than is contained in the sodium bonded spent fuel.[3] As the DOE proposes to directly place naval fuel in Yucca Mountain, it is not clear why the HEU in the sodium fuel needs to be separated and isotopically diluted. **46-9**
- The DEIS does not mention the fact that the sodium bonded spent fuel is only a small portion of the metallic uranium fuel in the Energy Department's inventory.[4] The majority of the Uranium metal fuel (including fuels made of uranium alloys) is from the N-reactor. There is no indication that N-reactor fuel will be processed to change the form of the Uranium. As this fuel will also contain plutonium, it is not clear why the metal form of the U and Pu in the sodium bonded spent fuel is a problem that cannot be mitigated. The Environmental Impact Statement itself states that reactive metals may be allowed if packaged to minimize rapid oxidation. (1-3) The overwhelming emphasis placed on the sodium in the DEIS also indicates that the metal U and Pu are of secondary concern. If this is not the case, the DEIS should be clear under what circumstances the U or Pu can be expected to be reactive and what other mitigation measures are possible. **46-10**
- The DEIS should also be clear that some of the processing is specifically for the metallic uranium and plutonium. For example, PUREX processing of blanket fuel would occur *after* sodium removal in an argon hot-cell. Thus, PUREX is not a factor in making the fuel safe from the risks of metallic sodium. PUREX would be used to change the form of the uranium (the final form of the plutonium would still be metal, only it would be separated plutonium metal). **46-11**

In the "Background" section of the DEIS, it is noted that the research and demonstration project for Electrometallurgical Treatment (EMT) was coming to an end in August, 1999. EMT is one of the main technologies under consideration in this DEIS, and, in fact, the original scope of the DEIS was supposed to be only EMT. What the **46-12**

[3] The DOE anticipates 65 metric tons of heavy metal (MTHM) of naval spent nuclear fuel through 2035. U.S. Department of Energy, Office of Civilian Radioactive Waste Management, *Draft Environmental Impact Statement for a geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* DOE/EIS-0250D, July 1999. p. A-24

[4] ibid., p. A-24

consideration is the removal or conversion of metallic sodium to a nonreactive form.

46-7: The timing for the proposed action is not primarily dictated by constraints imposed by the State of Idaho Settlement Agreement and Consent Order. See response to comment 46-3.

46-8: The EIS, under Alternative 2 (Section 2.5.3), analyzes the environmental impacts of removing sodium from 57 metric tons of blanket sodium-bonded spent nuclear fuel and the subsequent packaging of this fuel in high-integrity cans. The environmental consequences of this action are presented in Section 4.4. As described in Appendix D, Section D.3.2.2, the uranium in the 57 metric tons of blanket fuel is depleted uranium and not highly-enriched uranium. Section 2.2 of the EIS was revised to be consistent with the information presented in Appendix D. If the finalized waste acceptance criteria for the repository require the removal of sodium from the spent nuclear fuel, this requirement would apply to all of the 60 metric tons of sodium-bonded spent nuclear fuel addressed in this EIS. As described in Sections 2.2 and 2.3.9 (Section 2.4.9 in the draft EIS), different treatment methods are required for the removal of sodium from driver fuel (3 metric tons) and blanket fuel (57 metric tons).

46-9: Disposal of HEU requires criticality control measures. Isotopic dilution of the HEU, while not necessary, would alleviate criticality concerns.

46-10: Section 2.2 of the EIS states that the 60 metric tons of heavy metal of sodium-bonded spent nuclear fuel constitutes approximately 2 percent of DOE's total current spent nuclear fuel inventory of nearly 2,500 metric tons of heavy metal. According to the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999, DOE spent nuclear fuel "may be accepted as bare fuel. The specific acceptance criteria for this bare fuel will be developed on a case by case basis." Therefore, the decision whether or not to treat spent nuclear fuel, including N-Reactor fuel, before emplacement in a geologic repository has not been made. As discussed in Section 1.2 of the EIS, the presence of metallic sodium is the primary but not the only reason for the proposed action. The presence of metallic uranium, or the presence of highly enriched uranium, could also complicate the process of certifying the repository if it accepted sodium-bonded spent nuclear fuel for disposal. Qualification of the spent fuel for disposal in a geologic repository would require sufficient data and predictive analyses to demonstrate that emplacement of the spent nuclear fuel would not adversely

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DOE has not stated is that without this Action there would be no more funds available for EMT and DOE needs to make a decision now on whether to proceed with this technology. The "Purpose and Need for Action" should clearly state that these programmatic considerations, maintaining an EMT program and possibly using the Savannah River canyons which are slated to be shutdown, are driving the timing of this project.

46-12 (Cont'd)

In addition to the manner in which the purpose and need for this action have been presented, there are also serious problems with DOE's presentation of the health effects of radiation. Surprisingly, the DEIS indicates that the dose to the general population near Argonne National Laboratory – West is ten times higher under the "No Action Alternative" (which would not involve any processing) than for Electrometallurgical Treatment of the spent fuel. (2-48) When asked at the public meeting held in Crystal City, VA on August 31, 1999, the representative from the EIS team stated that this was an artifact of an assumption used for the draft EIS. It seems that the inventory of spent fuel was based on a 1995 Programmatic EIS rather than the actual inventory at the Idaho National Engineering and Environmental Laboratory. The final EIS will be revised to reflect actual conditions.[5] However, the draft EIS is the only opportunity for the public to comment on the health effects of this action and potentially decide whether or not to support processing this fuel. Presenting the data in this manner on such a crucial issue is misleading.

46-13

Perhaps even more egregious, however, is the presentation in the DEIS of radiation risk and the use of the linear no-threshold theory for calculating risk. The EIS states that "[C]alculations of health impacts based on the linear no-threshold theory may overstate the actual impacts of low radiation doses and should be viewed as an upper bound on the potential health effects." (page 4-6) This statement is dubious at best. It is contradicted by works produced by scientific bodies including the National Academy of Sciences' Committee on the Biological Effects of Ionizing Radiation (BEIR), the International Commission on Radiological Protection (ICRP), and, notably, the National Council on Radiation Protection and Measurements (NCRP):

- "[I]t must be presumed that even small radiation doses may produce some deleterious health effect." (ICRP, 1991, *1990 Recommendations of the International Commission on Radiological Protection. ICRP Publication 60*, paragraph 100, page 25)
- "[T]he probability of a cancer resulting from radiation increases with increments of dose, probably with no threshold." (ICRP, 1991, Paragraph 58, page 69)
- "In spite of evidence that the molecular lesions which give rise to somatic and genetic damage can be repaired to a considerable degree, the new data do not contradict the hypothesis, at least with respect to cancer induction and hereditary genetic effects, that the frequency of such effects increases with low-level radiation as a linear, nonthreshold function of the dose." (BEIR V, 1990. *Health Effects of Exposure to Low Levels of Ionizing Radiation*, Committee on the Biological Effects of Ionizing Radiation, National Research Council, page 4)

46-14

[5] Our thanks go to Dr. Lyman of the Nuclear Control Institute for pointing out this fact and asking the question.

Response to Commentor No. 46 (Cont'd):

affect the repository's ability to protect the environment and worker and public health and safety. To ensure the requirements of the State of Idaho Settlement Agreement and Consent Order are met, and to facilitate disposal, DOE needs to reduce the uncertainties associated with qualifying sodium-bonded spent nuclear fuel for disposal. Appropriate treatment and management of the sodium-bonded spent nuclear fuel would significantly reduce complications related to disposal qualifications.

46-11: As described in Section 2.5.4 of the EIS, DOE evaluated PUREX processing as one of the alternatives for the treatment and management of sodium-bonded spent nuclear fuel. PUREX processing at SRS was included as a reasonable alternative in response to the National Research Council's recommendation that only PUREX processing would provide a viable alternative to the electrometallurgical treatment technology. However, since the sodium-bonded spent fuel contains metallic sodium, stainless steel, and zirconium, PUREX processing of this fuel would require the development and installation of a front-end process to ensure compatibility with the F-Canyon operation. Therefore, only the declad and cleaned blanket spent nuclear fuel, which is mainly depleted uranium metal and fission products, would be processed using PUREX at F-Canyon. In this process depleted uranium and plutonium metals would be separated from the fission products. The fission products would be vitrified as borosilicate glass in the Defense Waste Processing Facility, stored at the site, and transferred to a geologic repository. As explained in Section 4.1.2 of the EIS, the separated depleted uranium and plutonium would be stored at SRS pending a decision on their disposition.

46-12: DOE is committed to improving its environmental management practices; to operating its facilities in a manner that meets or exceeds all applicable environmental, safety, and health requirements; and to cleaning up its environmental problems. The focus of the EIS is to assess the potential environmental and health impacts associated with treatment and management of sodium-bonded spent nuclear fuel. Although not final, the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999 (see Section 4.12.1 of the EIS) indicates it is highly probable that sodium-bonded spent nuclear fuel would not be acceptable in the geologic repository without some stabilization and/or removal of the metallic sodium. Stabilization of the spent nuclear fuel and/or removal of the metallic sodium will provide greater protection of human health and the environment. Having completed the Electrometallurgical Treatment Research and Demonstration Project (see

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- "The dose-dependent excess of mortality from all cancer other than leukemia, shows no departure from linearity in the range below 4 sievert (Sv), whereas the mortality data for leukemia are compatible with a linear-quadratic dose response relationship." (BEIR V, 1990, Page 5)

More egregiously, the DOE misrepresents the 1995 NCRP report it quotes in the EIS by taking the quote out of context[6]. Here is what the EIS does *not* include:

"3.5 Summary

"Taken as a whole, the body of evidence from both laboratory animals and human studies allows a presumption of a linear no threshold response at low doses and low-dose rates, for both mutations and carcinogenesis." (NCRP, 1995. *Principles and Application of Collective Dose in Radiation Protection, NCRP Report No. 121*, page 45)"

As more has been learned about the health effects of radiation, radiation risk estimates have been revised upwards. This indicates that, over time, exposure to radiation has been found to be more harmful than previously believed. For instance, the 1990 BEIR V report noted that, upon reassessment of A-bomb dosimetry, "lifetime risk of cancer attributable to a given dose of gamma radiation now appears somewhat larger than formerly estimated," (page 5) and that, "[t]he dose-dependent increase in the frequency of mental retardation in prenatally irradiated A-bomb survivors implies the possibility of higher risks to the embryo from low-level irradiation than have been suspected heretofore" (page 8). **46-14 (Cont'd)**

The seventh BEIR committee (BEIR VII) has just convened to reassess the health effects to humans of exposure to low doses of ionizing radiation. There are many questions it faces before it can assess whether current risk estimates are too tight. As the attached September 3rd letter indicates, the BEIR VII committee has yet to consider the range of risks involved. It is very premature to claim that the linear no threshold hypothesis overstates the risks of low-level radiation, to say the least.

It is curious that this EIS, unlike some others, fails to include basic information about the health effects of radiation, and instead includes a weak dispute of the linear no threshold hypothesis. The DOE cannot credibly dismiss the linear no-threshold hypothesis, a long-held assumption in radiation and health circles, on the basis of one study and a misrepresentation of another, as it appears is the case in this EIS.

By failing to provide full and accurate information about what is and is not known about the health risks of radiation, the DOE, its EIS contractor SAIC, and the EIS itself lose credibility and public trust.

The section on health effects in this EIS should be rewritten to incorporate the aforementioned comments.

Not only is the DOE proposing an action which is clearly unnecessary at this time and entails programmatic risks since the final waste forms may not meet final repository **46-15**

[6] On page 4-6, the EIS quotes the NCRP report from page 45: "...essentially no human data can be said to prove or even to provide direct support for the concept of collective dose with its implicit uncertainties on nonthreshold, linearity and dose-rate independence with respect to risk."

Response to Commentor No. 46 (Cont'd):

Section 1.6.3) and in planning the closure of its PUREX processing capabilities, DOE now needs to decide whether these processes are suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in a loss of capability and of experienced, knowledgeable technical staff should DOE decide at a later date to use the electrometallurgical process to treat the sodium-bonded spent nuclear fuel. Section 1.2 of the EIS has been revised for clarification. DOE also has conducted four independent nonproliferation impacts assessments of the electrometallurgical treatment technology over the last 11 years. These assessments found the electrometallurgical treatment technology does not conflict with U.S. nuclear nonproliferation policy for this specific application, and have concluded that the electrometallurgical treatment technology is not capable of separating plutonium in a form that would be suitable for weapons production.

46-13: Air emissions under the No Action Alternative in the draft EIS were estimated using the adjusted values given in the No Action Alternative in the Programmatic Spent Nuclear Fuel EIS. The adjustment was based on the ratio of heavy mass inventory of the sodium-bonded spent nuclear fuel (60 metric tons) to the entire spent nuclear fuel inventory (274 metric tons) at INEEL. DOE assumed this estimate bounds any future degradation of the sodium-bonded spent nuclear fuel during storage at the INEEL site. The consequences resulting from this estimate were very small, and there was no intention to mislead the public. Since the issuance of the draft EIS, DOE has modified the activities under both options of the No Action Alternative as described in Section 4.2 of the final EIS, reevaluated the potential for sodium-bonded spent fuel degradation in wet and dry storage and revised the air emissions and associated health effects. The new results are provided in the final EIS.

46-14: As described in Section 4.1.3 of the EIS, the estimated health effects from radiation doses used in this EIS are based on the linear-no-threshold theory of radiation carcinogenesis. DOE would not consider any threshold in evaluating the potential cancer risk associated from radiation exposure, i.e., the limit of the range is extended to zero dose. As explained in Appendix E, Section E.2.2, of the EIS, there is a scientific uncertainty about cancer risk in the low-dose region below the range of epidemiologic observation, and the possibility of no risk cannot be excluded (from Committee on Interagency Radiation Research and Policy Coordination, Seiene Panel Report No. 9). DOE has revised the text in Section 4.1.3 of the EIS to remove the contentious

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46-15 (Cont'd)

criteria, it is doing so in a way that poses significant nonproliferation problems. The Department should be commended for conducting a parallel Nonproliferation Assessment.[7] However, the resulting document seriously downplays some of the proliferation implications of the proposed actions, particularly Electrometallurgical Treatment (EMT).[8] The Nonproliferation Assessment does note many of the important proliferation risks posed by EMT:

46-16

- EMT can produce weapons-usable HEU
- EMT is a subset of a larger process which can separate plutonium and therefore has parallels with traditional reprocessing techniques such as PUREX

46-17

- EMT involves bulk processing which makes international safeguards harder to implement

46-18

- Safeguards have not been demonstrated since this a new technology.

However, the Assessment's system for grading the proliferation impacts, while a good start, was not sufficient. Each of the processing technologies was graded based on four policy factors[9] and three technical factors.[10] Each technology was graded on each factor. The grades were "fully meets nonproliferation objectives," "could raise nonproliferation concerns," and "raises nonproliferation concerns." Additionally, each of the DEIS alternatives (some of which involve using two different technologies for different portions of the fuel) were also graded on the same factors and with the same grading system. This system of grading poses a number of problems:

46-19

- There were no explicit criteria for choosing a particular grade for a particular technology or alternative.
- It was not made clear how mitigating factors were accounted for in the grading. There were a number of instances in which a proliferation concern was expressed, but a mitigating factor was also explained.

[7] United States Department of Energy, Office of Arms Control and Nonproliferation, *Nonproliferation Impacts Assessment for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel*, July 1999, (hereinafter referred to as "Assessment")

[8] This discussion of the nonproliferation impacts of actions proposed in this DEIS will focus on electrometallurgical treatment for three reasons. First, the original intent was to undertake an EIS on EMT. The scope was only expanded after the scoping hearings on the original EIS. Second, EMT would be used for five of the six alternatives presented (not including the "No Action Alternative.") Third, EMT has the potential for widespread global use under the rubric of either waste management or advanced nuclear fuel cycles (both as a stand-alone technology and as part of a more comprehensive pyro-processing system for which EMT is a crucial component). However, all of the technology choices have serious nonproliferation implications with the possible exception of repackaging in high-integrity cans of blanket spent fuel.

[9] Consistency with Nonproliferation policy, Avoiding encouragement of plutonium reprocessing, Building confidence that the United States is not producing materials for weapons, Supporting negotiations for a Fissile Materials Cut-off Treaty.

[10] Assuring against theft or diversion, Facilitating cost-effective international monitoring, Difficult-to-retrieve final form.

Response to Commentor No. 46 (Cont'd):

statement by providing a reference to the discussion provided in Appendix E, Section E.2.2.

46-15: See response to comment 46-3.

46-16: The commentor's support for conducting the Nonproliferation Impacts Assessment is noted. Although the assessment of nonproliferation impacts is not a part of the EIS process, none of the alternatives analyzed in this EIS, with the exception of PUREX processing at SRS, would generate weapons-usable fissile materials. Although highly enriched uranium would be an interim product, it would be down-blended to low-enriched uranium during electrometallurgical treatment.

46-17: Although assessment of nonproliferation impacts is not a part of the EIS process, it should be noted that electrometallurgical treatment is not capable of producing plutonium for nuclear explosive purposes. As conceived for the cancelled Integral Fast Reactor project, the liquid cadmium cathode would have produced a metal alloy product containing up to 70 percent plutonium, which could only have been obtained after subsequent processing in a high-temperature vacuum furnace. The balance of materials would be those elements most difficult to separate from plutonium by any chemical means, such as uranium, americium, neptunium, curium, and the rare earth fission products. The plutonium metal alloy product would have a high fission product and transuranic content, a high heat source, a high neutron radiation source, and a high gamma radiation source, any one of which would make the design of a weapon extremely difficult. Neutron and gamma radiation would be three to four orders of magnitude higher than weapons-grade or reactor-grade material. These levels of radiation are lethal and would prohibit any handling of the material or weapon by other than remote means. Development of the cathode progressed only to the point of technical feasibility. No prototype or working model was ever commissioned for the Fuel Conditioning Facility. During electrometallurgical treatment, plutonium would stay mixed with the fission products and electrolyte salt. The plutonium and fission products then would be immobilized in the ceramic waste form. The ceramic waste form is more resistant to plutonium recovery than the metallic waste forms that result under the other alternatives that employ melt and dilute technologies and high-integrity cans.

46-18: There are several features of the electrometallurgical treatment process that make it adaptable to international safeguards. The process cell, made inaccessible to humans by high radiation, inert atmosphere, and thick concrete walls, has a minimal number of penetrations through which materials can be

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- Chapter Six, evaluating the individual technologies, only considered the US context (as clearly indicated by the title chapter).[1] This is insufficient as proliferation is clearly a global issue.
- It is not made explicit how the combinations of individual grades for different technologies were combined to derive an overall grade for each alternative.
- While EMT in the global context was discussed in terms of the four policy and three technical factors (Assessment, Section 3.5) there were no formal grades assigned. If a grading system was to be used, it should have been used consistently whenever a technology or alternative was being discussed in terms of the technical and policy factors. The result is that EMT was only graded in the U.S. context in Chapter Six.

46-19 (Cont'd)

The Assessment also downplays some of the proliferation risks, resulting in grades which are lower than they would be if a more comprehensive evaluation had been conducted. For example, there is little justification for the conclusion that EMT "*could* raise nonproliferation concerns" for facilitating cost-effective monitoring. This is a bulk processing method with fissile materials separations and *no demonstrated system for safeguards*. (Assessment, p. 6-3)

More puzzling is the conclusion that EMT fully maintains consistency with US nonproliferation policy. The DOE apparently reached this conclusion because there would be no separation of plutonium. However, this is a very narrow definition of US nonproliferation policy and objectives given the connection of EMT with systems that could result in plutonium separation. The Assessment itself notes in its section on the global implications of EMT that "both domestic and export applications of EMT pose concerns with respect to U.S. Nonproliferation policy." (Assessment, p. 3-15) The fact that the HEU would be diluted or that export controls would be put in place do not adequately mitigate the proliferation implications.

46-20

The DOE also concludes that EMT only "*could* raise concerns" about avoiding encouragement of plutonium processing. This is despite the statement that:

> Extending the time that U.S. separations facilities operate and using a separations process to prepare spent nuclear fuel for geologic disposal (while at the same time acknowledging that the fuel does not pose near-term safety and health vulnerabilities and that such processing technically is not required) could serve to undermine U.S. credibility in expressing concern to other countries about the proliferation problems associated with conventional reprocessing in the nuclear fuel cycle. (Assessment, p. 6-4)

46-21

The justification for the mid-level grade (rather than concluding that this would raise proliferation concerns) is that the US can make it clear that this is being done to address specific chemical requirements of a small batch of fuel, that plutonium is not separated, and that it is being done for spent fuel disposal "rather than as part of a breeder reactor fuel cycle." (Assessment, p. 6-4) This ignores the earlier statement (in the same paragraph) that the processing is not required in the near term. More significantly, it ignores the possibility that others would use the justification of spent fuel management to

[1] "Evaluation of the Technologies in the U.S. Context as Scoped in the *Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel*."

Response to Commentor No. 46 (Cont'd):

moved in and out. These openings are secured and can be readily monitored for material transfers. There are no liquid waste streams through which materials can be piped out of the facility. All by-products and waste from the process would be in solid form, and so would be accountable by unit inventory. Finally, all by-products and waste moving out of the facility could be subjected to nondestructive examination if additional assurances were required under international safeguards agreements.

46-19: The assessment of nonproliferation impacts is not part of the scope of the EIS. However, the Nonproliferation Impacts Assessment for the management of DOE's sodium-bonded spent nuclear fuel was conducted to be consistent with nonproliferation assessments for other proposed DOE activities. A group of independent experts reviewed all the reasonable alternatives included in the draft EIS for nonproliferation considerations based on both policy and technology. While their conclusions are necessarily somewhat subjective, DOE is satisfied that the report represents a fair, unbiased view of the nonproliferation impacts of the alternatives. The report was reviewed and approved by the DOE Office of Arms Control and Nonproliferation prior to its issuance. DOE believes that the U.S. context is appropriate for the technical evaluation. The types of spent fuel that would be managed under the alternatives considered in the draft EIS are unique to U.S. research reactors. All activities would be carried out under the DOE safeguards and security requirements implemented to prevent the theft and diversion of nuclear materials, including spent fuel. The global implications have been considered under policy factors. The potential impacts of the various alternatives on U.S. nonproliferation policy are described in Chapter 6 of the Nonproliferation Impacts Assessment and in the conclusions of the assessment.

46-20: The United States' policy on nonproliferation is contained in Presidential Decision Directive 13, a classified document. At the time the Presidential Directive was signed, an unclassified press release stated that, "The U.S. will seek to eliminate where possible the accumulation of stockpiles of highly-enriched uranium or plutonium." This would be done by down-blending the highly enriched uranium in the driver spent nuclear fuel and immobilizing the plutonium in the ceramic waste form. The press release also stated that the United States "does not itself engage in plutonium reprocessing for either nuclear power or nuclear explosive purposes." Under the electrometallurgical treatment, the plutonium would be immobilized in the ceramic waste form.

Commentor No. 46: H. Zerriffi & L. Ledwidge (Cont'd)

implement a full pyroprocessing system with plutonium separation. Research into such systems is already on-going in a number of countries and the U.S. implementation of a subset of pyroprocessing will clearly undermine U.S. credibility. **46-21 (Cont'd)**

Electrometallurgical treatment should not be considered in isolation of its possible configuration for removal of plutonium nor without considering additional processing steps which could be implemented to further separate plutonium. While the current configuration does not result in separated plutonium, EMT should still be considered a reprocessing technology. Furthermore, EMT alone can result in separation of HEU and so should be considered a reprocessing technology on that basis. **46-20**

As noted by the Nonproliferation Assessment, EMT can be modified in order to separate Pu, either by adding in a cadmium cathode and other equipment developed for pyroprocessing of IFR fuel or by processing the residual waste from EMT. What is not made explicit is the difference in proliferation barrier between spent fuel and EMT waste. The addition of the cadmium cathode to separate plutonium and a cathode processor would result in a product which is as high as 70% plutonium, 30% actinides and <1% rare earth fission products.[12] Aqueous processing to further separate the plutonium would be on a much smaller scale than that necessary for PUREX processing of the entire amount of spent fuel. The total amount of material to be processed would be about 100 to 1000 times less for the same amount of plutonium separation. Conceivably this could be done on a glove-box scale, assuming lower concern about worker health. The process would result in significantly less detectable air emissions since the volatile fission products would have already gone through the pyroprocessing stage and been emitted. The Nonproliferation Assessment does not discuss the effect this would have on implementation of international safeguards. **46-17**

The Nonproliferation Assessment relies too heavily on the implementation of safeguards and on U.S. pronouncements as to the purpose of processing this particular spent fuel. These are inadequate mitigating factor. Safeguards do not have an absolute guarantee of success and are made more difficult by the types of processes discussed here. Generally, it would be best to avoid using these types of processing technologies, rather than rely on safeguards. **46-18**

The Assessment also does not seem to integrate its discussion in Chapter three concerning the "Potential use of Electrometallurgical Treatment in a Global Context" with its evaluation about the U.S. context. The evaluation of EMT for this EIS cannot and should not be done with only the US context in mind. Both the US and global contexts need to be considered and the future of Electrometallurgical processing technologies needs to be integrated into the discussion. By separating these considerations, the Assessment seriously downplays the implications of EMT and reaches conclusions which cannot be supported when one looks at the overall picture. **46-19**

In conclusion, there is no need for this action at this time. The spent fuel should be stored pending determination of Yucca Mountain's suitability as a repository and of **46-6 46-4**

[12] U.S. Congress, Office of Technology Assessment, *Technical Options for the Advanced Liquid Metal Reactor - Background Paper*, OTA-BP-ENV-126 (Washington, DC: U.S. Government Printing Office, May 1994): p. 21.

Response to Commentor No. 46 (Cont'd):

46-21: As stated in the Nonproliferation Impacts Assessment, the alternatives involving PUREX reprocessing and broad application of electrometallurgical treatment of both driver and blanket fuel have a greater potential to provide encouragement to other countries to engage in plutonium reprocessing. Given the small quantity and unique characteristics of the sodium-bonded spent nuclear fuel and the reason for the treatment, however, such encouragement, if any, would be limited. Sodium-bonded spent nuclear fuel represents approximately 2 percent of DOE's spent nuclear fuel inventory.

46-22: The commentor's opinion that development of technologies such as GMODS and Plasma Arc processing on the bases that they do not involve fissile material separation, is noted. As discussed in Section 1.5 of the EIS, one of the decisions that DOE could make in the Record of Decision is to take no action now and promote the development of a less mature technology (like GMODS and Plasma Arc) or some other new treatment technology (see also Section 4.2 of the EIS).

Commentor No. 46: H. Zerriffi & L. Ledwidge (Cont'd)

final waste acceptance criteria for whatever high-level waste management strategy is finally chosen. Avoiding the complete close-out of the EMT project is not a sufficient reason for undertaking this project, both from a health and environment and a non-proliferation perspective. In the meantime, there may be justification in proceeding with technology development of alternatives to the proposed processes, such as GMODS and Plasma Arc processing, which do not have fissile material separation or the possibility of being configured for fissile material separation. **46-5** **46-12** **46-22**

If the Department of Energy undertakes reprocessing of this spent fuel under the guise of environmental management it will set a dangerous precedent and significantly harm U.S. nonproliferation objectives. Electrometallurgical treatment, which appears to be the favored technology for at least part of the waste, poses particular concern because of its potential for clandestine plutonium separation, its potential use as a "waste management technique" in the context of "advanced" fuel cycles (with the explicit goal of plutonium separation) both in the United States and abroad and its use of a bulk process for which international safeguards have not yet been established. Pyroprocessing is an active area of inquiry in many nuclear countries, including the U.S., and continued U.S. interest in this technology and the application of a subset of pyroprocessing, would irreparably harm the U.S. government's credibility on nonproliferation. **46-15**

Response to Commentor No. 46 :

Commentor No. 47: Ted L. Carpenter

SENT BY: 9-28-98 ;11:11AM ;SHOBAN TRIBES-ATTY'S- 3014281973;# 1/ 1

The SHOSHONE-BANNOCK TRIBES

FORT HALL INDIAN RESERVATION
PROJECT DIRECTOR (208) 478-3782
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TRIBAL/DOE PROJECT
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Jeffrey J. Rikhoff, Senior Planner
Scientific Applications International Corporation
2021 Century Blvd., 3rd Floor
Germantown, Maryland 20874
FAX: 301-428-1973

Dear Jeffery

Thank-you for your assistance during the August 26 meeting in Idaho Falls. I appreciated the professional service provided by everyone involved in providing public information that evening.

I have studied all of the provided materials. My comments must not be considered "speaking for the Tribes." Only the Tribal Council officially does that. As the Tribal/DOE Project Environmentalist, I will comment.

Considering all of this material "60 metric tons of heavy metal of sodium-bonded . . . fuel" to be "waste" for "disposal" seems worse than killing a Bison, taking the tongue (or the tongue and the hide), then leaving every other part of the animal to rot! Molybdenum, ruthenium, rhodium, palladium, uranium, zirconium, niobium, chromium, nickel, etc. are valuable resources that are expensive to mine and refine by environmentally responsible methods. 47-1

The electrometallurgical process seems to have the most potential for wise, environmentally responsible use of the Earth's resources. Your own documents (p. S 13 in the Summary) state that "the electrometallurgical treatment process uses electrorefining, an industrial technology used to produce pure metals from impure feedstock. Electrorefining has been used to purify metals for more than 100 years."

Alternatives 3 and 6 would produce increased environmental impact because of the thousands of miles of transportation required between the INEEL and the Savanna River Site. Fossil fuels would be burned to fuel the engines that transport those materials. Additionally, the transportation route crosses the Fort Hall Reservation of the Shoshone-Bannock Tribes. I encourage you to consider sodium-bonded driver fuel and blanket fuel treatment and management systems that minimize shipments of these materials across the reservation. Personally, I do not imagine any radiation hazard to the Reservation community because of those shipments, but the fears of many here are real. Because of those fears, I consider transportation across these Tribal lands to be a serious issue. 47-2

I have only one sort-of technical comment. On page S-2 of the Summary, I read, "Metallic sodium reacts vigorously with water or moist air. . . ." Obviously, sodium reacts vigorously with moist air because moist air contains water in the form of water vapor. Thus the "or" is incorrect. Water in a liquid or vapor form will react vigorously with sodium resulting in spontaneous combustion of the hydrogen gas that is released by the reaction. 47-3

Please feel free to contact me if you have any questions.

Sincerely,

Ted L. Carpenter, Ph.D.

Response to Commentor No. 47:

47-1: Most of the noble metal fission products (e.g., niobium, technetium, ruthenium, rubidium, silver, cadmium, and zirconium) and fuel alloy (zirconium) in the electrorefiners would remain with the fuel cladding hull in the anode basket. In addition, some actinides would also remain with the noble fission products. The amount of material retained in the anode basket would strictly depend on the electrorefining operation conditions. If more actinides and the fuel matrix were dissolved in the molten salts, the retention of noble fission products would be lowered. The metal remains in the anode basket would be radioactive, and would be classified as high-level radioactive waste. It is true that electrometallurgical treatment has been used to produce metals from impure feedstock. However, that impure feedstock included metals with chemical contamination, not radioactive isotopes of the same metals. Noble metal recovery from the metallic waste would have limited uses because the metal would still be radioactive (i.e., it would contain radioactive isotopes of the metal elements), and would still be considered radioactive metallic waste. However, uranium would be separated and could be used for other purposes. The disposition of this uranium, along with DOE's inventory of surplus uranium, will be determined through another NEPA review.

47-2: DOE assumes that the commentor is referring to Alternative 3 and 5 (not 6), in which the declad and cleaned (metallic sodium removed) blanket spent nuclear fuel would be transported to SRS for treatment. As explained in the EIS, the risks associated with the fuel transport are very small. Regardless of the alternative, DOE would need to transport spent nuclear fuel and/or high-level waste out of INEEL. DOE will proceed in accordance with the DOE/Shoshone-Bannock Tribes Agreement-in-Principal, which covers notification and coordination of the transport of radioactive materials across the Fort Hall Reservation. All risks, including transportation, are included in the EIS and will be considered by DOE prior to making any decisions regarding the treatment and management of sodium-bonded spent nuclear fuel.

47-3: The commentor is correct, metallic sodium reacts with water and, consequently, moist air. The text has been revised accordingly.

Commentor No. 48: Debra Patla

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_____Forward Header_____
Subject:    INEEL pyro
Author: dpatla@tetonvalley.net_at_INTERNET
Date:       10/4/99 11:14 PM

Dear Ms. Lesica,
I strongly object to "pyroprocessing" at INEEL.  I was stunned to
hear that plans are again being advanced for reprocessing spent
nuclear fuel at the INEEL.  I thought this bad idea was put to bed
years ago when the Special Isotope Separator was finally rejected.

I am an Idaho resident and a "down-winder".  The DoE site at
INEEL is viewed very negatively in this area (near the Teton
Mountains), particularly since the plan was launched to incinerate
nuclear wastes at INEEL.  We don't trust the government to take care of
our health and welfare.  We fear that Idaho and Wyoming are a rural no-
place to headquarters  DoE, a throw-away zone because the population of
humans is low, making INEEL a great place for creating and storing
deadly elements.

I am protesting not only as an Idaho resident.  Weapons-grade
plutonium and uranium is the last thing the world needs.

The EIS should reveal estimates of how much weapon-grade
Plutonium and uranium exists, and how much may be in hands of elements
hostile to the U.S. or other governments.  It should estimate, given
past trends and possible future scenarios, what is the likelihood that
the products will be used to destroy life and/or induce global
instability.

The EIS should clearly document who initiated this project, and
why.  The trail of responsibility for this project should be made
clear so that in the event of future disasters, the American and global
public will know who is responsible.

The EIS should attempt to analyze how interrelationships of private
industry and government officials contributed to the initiation of this
project.  It should assess the 'revolving door' whereby DoE and
military personnel end up in related private industries after they
leave government service.

It should document what kinds of freedoms might end up being restricted
if DoE institutes stricter security measures.

The EIS should document how much waste will be generated by this
project and where it will be stored, both temporarily and permanently.

It should look at cumulative effects, and reveal how much waste exists
at INEEL.  It should analyze the costs of total clean-up, and reveal
how much this project will add to total clean-up costs.
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Response to Commentor No. 48:

48-1: The commentor's objection to electrometallurgical treatment (pyroprocessing) at INEEL is noted. This EIS evaluates several alternatives to electrometallurgical treatment including a No Action Alternative. The Special Isotope Separator referred to by the commentor was a weapons material production facility planned for INEEL back in the late 1980s. This facility was designed to use laser processing to produce weapons-grade plutonium from fuel-grade plutonium. The Special Isotope Separation Project EIS (DOE/EIS-0136) was published in November 1988. With the end of the Cold War, the need for plutonium production disappeared, and plans for the plutonium separation plant were halted. The special isotope separation laser process would not support the treatment and management and ultimate disposition of sodium-bonded spent nuclear fuel.

48-2: DOE has agreed to move all spent nuclear fuel out of the State of Idaho by 2035. To fulfill this commitment and prepare the fuel for ultimate disposal, DOE is proposing to treat and manage its sodium-bonded spent nuclear fuel at either INEEL or SRS.

48-3: Although the assessment of nonproliferation impacts is not a part of the EIS process, none of the alternatives analyzed in this EIS, with the exception of PUREX processing at SRS, would generate weapons-usable fissile materials. Although highly enriched uranium is an interim product, it is downblended to low-enriched uranium during electrometallurgical treatment. Alternative 3, PUREX processing, is the only alternative that would generate weapons-usable fissile material, including plutonium. This plutonium would be managed along with other surplus plutonium as described in the Surplus Plutonium Disposition EIS. The SBSNF EIS has been prepared in accordance with NEPA, Council on Environmental Quality regulations on implementing NEPA (40 CFR 1500-1508), and DOE's NEPA implementation procedures (10 CFR 1021). As discussed in the introduction, the basic objective of this EIS is to provide the public and DOE decision-makers with a description of the reasonable alternatives for the treatment and management of DOE's sodium-bonded spent nuclear fuel and their potential environmental impact. Estimating how much plutonium and uranium exists and the likelihood of these materials being used to destroy life and/or induce global instability are beyond the scope of the EIS.

Commentor No. 48: Debra Patla (Cont'd)

The EIS should attempt to measure how much risk to U.S. citizens this project poses, both in the present, 20 years from now, and long into the future. This analysis should be reviewed by impartial sources rather than DoE. Their commentary should be included within the EIS. **48-9** **48-10**

I urge DoE to start putting more money into environmental clean-up and protection rather than producing elements of potential mass murder. **48-11**

Sincerely,
Debra Patla
PO Box 230
Victor, ID 83455

Response to Commentor No. 48 (Cont'd):

48-4: The Electrometallurgical Treatment Research and Demonstration Project was initiated by DOE with Congressional funding to demonstrate electrometallurgical treatment technology, as directed by the 1995 Record of Decision for the Spent Nuclear Fuel Programmatic EIS (60 FR 28680). Near completion of the demonstration project, DOE developed this EIS to evaluate the potential environmental impacts of using electrometallurgical treatment or other technologies to treat the remaining sodium-bonded spent nuclear fuel and reduce the risk that the sodium-bonded spent nuclear fuel would not be accepted in a geologic repository. Chapter 1 of the EIS discusses the purpose and need for the proposed action. All preparers of the EIS, their organization, responsibilities, education, experience, and technical expertise are listed in Chapter 7 of the EIS. Council on Environmental Quality regulations 40 CFR 1506.5(c), which have been adopted by DOE (10 CFR 1021), require contractors preparing this EIS to execute a disclosure statement specifying they have no financial or other interest in the outcome of the project. This disclosure statement is provided in Appendix L of the EIS. Analyzing private industry and government interrelationships and the actions of DOE and military personnel after they leave government service are beyond the scope of this EIS.

48-5: The proposed action of the EIS does not require any changes in security.

48-6: The amount and form of the waste generated under each alternative are discussed in Chapter 4 of the EIS. The discussions in the chapter identify the final disposition of each waste form produced. For example, as described in Section 4.3.6, the ceramic and metallic high-level radioactive waste generated under Alternative 1 (electrometallurgically treat blanket and driver fuel at ANL-W) would be temporarily stored at the Radioactive Scrap and Waste Facility, and when a geologic repository is available the waste forms would be removed from storage and transferred to INEEL's Dry Transfer Facility for packaging and shipment to the repository.

48-7: Section 4.11.1.6 of the EIS summarizes cumulative waste generation at the INEEL site. This includes all waste currently present at the site, plus any new waste to be generated in the reasonably foreseeable future.

48-8: The SBSNF EIS has been prepared in accordance with NEPA, the Council on Environmental Quality regulations on implementing NEPA (40 CFR 1500-1508), and DOE's NEPA implementation procedures (10 CFR 1021). None of these require the inclusion of a cost analysis in an EIS. As discussed in the introduction, the basic objective of this EIS is to

the public and DOE decision-makers with a description of the reasonable alternatives for the treatment and management of DOE's sodium-bonded spent nuclear fuel and their potential environmental impact. However, DOE has issued a separate Cost Study that analyzes and compares the cost of the alternatives analyzed in the EIS. Cost will be considered during the decision-making process in preparing the Record of Decision.

48-9: DOE proposes to use the electrometallurgical treatment process to treat the sodium-bonded spent nuclear fuel and facilitate its ultimate disposal in a geologic repository. This process would transform about 60 metric tons of heavy metal sodium-bonded spent nuclear fuel into two inherently stable solid high-level waste forms. The process would take about 13 years to complete. Section 4.2 of the EIS discusses current risks to the public residing within 80 kilometers (50 miles) of the facilities where the sodium-bonded nuclear spent fuel is currently stored. The risks from operation of the electrometallurgical treatment process to the projected population (assumed to exist in the year 2010) residing within 80 kilometers (50 miles) of the facility are provided in Section 4.3 of the EIS. As explained in this section, the maximum annual dose to an individual from operation of this process is estimated to be less than 0.0004 millirem, or about 0.0001 percent of the background radiation dose. As explained in Section 4.3.6, the solid high-level waste would be packaged in special canisters and stored temporarily at the site. While in storage, this waste form would not pose any risks to any member of the public. This waste form is expected to be transferred to a geologic repository by 2035. The long-term impact from storage of this waste is evaluated in the Yucca Mountain EIS, which was issued in July 1999.

48-10: While the EIS has undergone internal DOE review, the NEPA public participation process provided an opportunity for all interested parties, including members of the public and Federal, state, local, and tribal officials, to independently review and comment on the draft EIS. All comments, along with DOE's responses, are included in the this final EIS.

48-11: Congress determines how funds are allocated. DOE spends monies consistent with Congressional direction. DOE is not in a position to make the difficult tradeoffs that may be required between alternative Federal programs and spending priorities. The issue of whether to fund the treatment and management of sodium-bonded spent nuclear fuel is beyond the scope of the SBSNF EIS. However, implementation of any of the sodium-bonded spent nuclear fuel treatment and management alternatives would not take

Commentor No. 48: Debra Patla

Response to Commentor No. 48 (Cont'd):

taxpayer dollars away from other environmental cleanup projects at INEEL. Each year Congress appropriates funds for environmental cleanup projects which are administered by the DOE Office of Environmental Management. The INEEL environmental cleanup efforts receive most of their money from these funds. Congress appropriates separate funds for spent nuclear fuel treatment, and these funds are administered by the DOE Office of Nuclear Energy, Science and Technology. The two sources of funds do not compete with each other.

Commentor No. 49: Kathleen E. Trever

Dirk Kempthorne, Governor
Kathleen E. Trever, Coordinator

INEEL Oversight
Idaho's eyes on the INEEL

900 North Skyline, Suite C • Idaho Falls, Idaho 83402
1410 North Hilton • Boise, Idaho 83706

September 28, 1999

Susan M. Lesica, EIS Document Manager
Office of Nuclear Facilities Management
Office of Nuclear Energy, Science and Technology
U.S. DOE, NE-40
19901 Germantown Road
Germantown, MD 20874-1290

Re: DEIS for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

Dear Ms. Lesica:

The State of Idaho INEEL Oversight Program submits the following comments on the Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel. Section and page references precede specific comments.

COMMENTS

Summary, page S-9, 1st paragraph, line 3; Volume 1, Section 1.6.1.7, pages 1-9 and 1-10
"The proposed Advanced Mixed Waste Treatment Facility would treat...." The Record of Decision for the AMWTP EIS was issued in March 1999. Therefore, "proposed" should be "planned", and "would" should be "will".

Summary, page S-9, 4th item in italics; Volume 1, Section 1.6.2.3, page 1-11
The correct name of the referenced EIS is *Idaho High-Level Waste and Facilities Disposition Environmental Impact Statement.* **49-1**

Summary, page S-10, last paragraph; Section S.8 Glossary; Volume 1, Section 2.2.1, page 2-3; Chapter 6 Glossary; Volume 2, Section D-2, page D-2
The only definition of fissium appears on page S-10; the term is used without definition in Volume 1, page 2-3 and in Volume 2, page D-2 (and perhaps elsewhere). "Fissium" should be added to the glossaries in Section S.8 and Chapter 6.

Summary, page S-13 to S-17; Volume 1, Sections 1.1 and 2.4
In each of these sections, the treatment methods that have been considered and eliminated should be identified as such and discussed in a separate section. It is confusing to read descriptions of GMODS, Chloride Volatility, etc. only to find out later that they have been eliminated from consideration. **49-2**

Response to Commentor No. 49:

49-1: The text cited by the commentor has been revised as appropriate. The name of the referenced EIS has been corrected. The term "fissium" has been added to the glossaries in Section S.10 and Chapter 6 of the EIS. The language used to explain or define "fissium" in Section S.2.1 of the Summary is also used in Section 2.2.1 of the draft EIS.

49-2: The purpose of Sections 1.1 and 2.4 of the draft EIS, as well as corresponding sections in the Summary, is to inform the reader of the pertinent characteristics of all potential technologies considered prior to selection of the reasonable alternatives presented in Section 2.6. Reasons why some of the technologies were dismissed from consideration as reasonable alternatives are found in Section 2.7. To avoid the confusion mentioned by the commentor, Section 2.3 of the final EIS has been revised to identify the dismissed technologies at an earlier point in the EIS.

49-3: Discharge waters to ANL-W's Industrial Waste Pond or Sanitary Sewage Lagoons are not waters of the U.S. and are exempted from compliance under the NPDES. However, these waters are designated as waters of the State of Idaho and, as such, require compliance with the state regulations that govern application of nonhazardous liquid waste (i.e., Land Application Permits). ANL-W applied to the State of Idaho for Land Application Permits for the Industrial Waste Pond and Ditches and the Sanitary Waste Treatment Pond Land Application Area on March 15, 1996, and July 17, 1998, respectively. ANL-W routinely monitors the effluent discharges to make sure they are within the limits identified in the Land Application Permits. The text of the various EIS sections of concern was revised to clarify that discharges are regulated in accordance with Idaho Land Application Permit requirements.

Commentor No. 49: Kathleen E. Trever (Cont'd)

Summary, Page S-31, 2nd paragraph; page S-37, 7th paragraph; Vol 1, Section 4.2.2, page 4-8, 3rd paragraph; Vol 1, Section 4.3.2, page 4-18, 3rd paragraph; Vol 1, Section 4.4.2, page 4-27, 2nd paragraph; Vol 1 Section 4.6.2 page 4-52, 5th paragraph; Vol 1, Section 4.8.2, page 4-76, 4th paragraph.

The statement "...discharges of nonhazardous liquid waste, which are monitored and subject to National Pollutant Discharge Elimination System (NPDES) permit requirements" implies that there is an NPDES permit for the industrial waste pond at ANL-W. However, the NPDES database does not include a permit for ANL-W. Further, the ANL-W Environmental Surveillance Report for 1997 did not refer to an NPDES permit. If there is an NPDES permit, its number should be included in section 3.2.4.1. References should also be identified to support the statement that the liquid waste is "nonhazardous" (e.g., results of TCLP analyses). **49-3**

Volume 1, Section 1.6.1.6, page 1-9; Section 3.2.11.9, pages 3-30 and 3-31

This section should note that DOE issued a Record of Decision on high-level waste from the Programmatic Waste Management EIS in August 1999. **49-4**

Volume 1, Section 1.6.2.2, page 1-11; Volume 1, Section 4.11.2, pages 4-103 to 4-105

These sections should reference the "Draft Environmental Impact Statement for a Geologic Repository..." issued in July 1999. **49-5**

Volume 1, Section 1.6.2.3, page 1-11, 1st paragraph under 1.6.2.3

"This EIS evaluates treatment alternatives for wastes that actions proposed in the SBSNF EIS could generate." The State of Idaho is familiar with the waste treatment alternatives in the forthcoming high-level waste EIS, but is unaware of the wastes referred to in this statement. The SBSNF EIS should identify what material and what quantities are or will be included. **49-6**

Volume 1, Section 2.4.1, Figure 2-2, page 2-7

The lower horizontal line between "Metal Casting" and "Cathode Processing" in the figure has arrowheads on both ends; it should have only one, probably on the left. **49-7**

Volume 1, Section 2.4.4, pages 2-10 and 2-11; Sections 2.6.4, 2.6.5, 2.6.6, and 2.6.7, pages 2-35 to 2-38; Sections 4.6, 4.7, and 4.8; Volume 2, Section C.4

What is the waste classification of the "metal waste form" or "melt and dilute product" that would be produced under the melt and dilute alternatives? Also, these alternatives only describe storage pending disposal; where would this material be disposed? Do these alternatives create a waste form whose ultimate disposal would be problematic? Would it be acceptable at the geologic repository? Is its isotopic content included in Appendix A of the draft EIS for the Geologic Repository? **49-8**

Volume 1, Section 2.6.4, pages 2-34 and 2-35; Section 4.1.2, page 4-3; Section 4.5.6, pages 4-47 to 4-51 **49-9**

2

Response to Commentor No. 49 (Cont'd):

49-4: The text cited by the commentor has been revised to incorporate the latest Record of Decision for DOE's Waste Management Program: Storage of High-Level Radioactive Waste (64 FR 46661). In this third decision, DOE would store immobilized high-level radioactive waste in a final form at the site of generation (Hanford, INEEL, SRS, or the West Valley Demonstration Project in New York) until transfer to a geologic repository.

49-5: The text cited by the commentor has been revised to state that the Yucca Mountain Draft EIS was published in July 1999. The equivalent section in the Summary was also revised to reflect this change of status in the ongoing NEPA actions.

49-6: The sentence identified by the commentor in the SBSNF Draft EIS is no longer correct. At the time this sentence was written, it was unclear what role, if any, the Idaho High-Level Waste and Facilities Disposition EIS would play in the treatment of waste generated by the treatment of sodium-bonded spent nuclear fuel at ANL-W. Since that time, it has been determined that the high-level radioactive waste generated by the treatment and management of sodium-bonded spent nuclear fuel at ANL-W would not require any additional treatment at INEEL and are not within the scope of the Idaho High-Level Waste and Facilities Disposition EIS, which only evaluates the treatment of specific amounts of calcined high-level and sodium-bearing, radioactive waste material currently located at INEEL. Section 1.6.2.3 has been revised.

49-7: The commentor is correct. The figure has been revised.

49-8: For the purposes of this EIS, the "metallic waste form" or "melt and dilute product" from the melt and dilute alternatives are considered to be high-level radioactive waste that would be disposed of in a geologic repository. Disposal of the metallic waste form or melt and dilute product from the melt and dilute alternatives in the geologic repository is not expected to be problematic. The Yucca Mountain Draft EIS assumes that all sodium-bonded spent nuclear fuel will be treated using the electrometallurgical process (Alternative 1 of this EIS) and the Yucca Mountain Draft EIS presents isotopic contents in its Appendix A that are in accordance with the electrometallurgical treatment process.

49-9: The amount of plutonium in the various sodium-bonded spent nuclear fuel is given in Appendix D, Section D.2. Section 4.1.2 of the EIS has been modified to provide a perspective on the amount of plutonium that would be separated from the cleaned and declad blanket spent nuclear fuel during PUREX

Commentor No. 49: Kathleen E. Trever (Cont'd)

One or more of these sections (as well as the appendix) should include the amount of plutonium that would be produced and compare it to the total amount of plutonium that is expected to be produced and stored at SRS. A summary of quantities would be useful for reviewers. **49-9 (Cont'd)**

Volume 1, Section 3.2.4, Figure 3-3, page 3-11
The reference "LMITC 1977" at the bottom of the figure should probably be "LMITCo 1997." **49-10**

Volume 1, Section 3.2.4.1, page 3-9, 5th paragraph
The text states "No flood maps of the Big Lost River are available...." This statement is not entirely true as maps of the flood plain are presented in Berenbrock and Kjelstrom (1998). Further, the reference given for the statement regarding the lack of flood plain maps (i.e. Abbott, Crockett, and Moor, 1997) is a predecisional draft. This EIS should cite the *original scientific study*. **49-11**

Volume 1, Section 3.2.4.1, page 3-9, 5th paragraph
The text states that "Flood diversion facilities... secured the INEEL from the 300-year flood" and references an EIS (i.e. DOE, 1996c) as support for this statement. Instead of citing another EIS, this EIS should cite the *original scientific study* that reached that conclusion. **49-12**

Volume 1, Section 3.2.4.1, page 3-9, Last paragraph
Provide a reference for the statement that the liquid waste is "nonhazardous." **49-3**

Volume 1, Section 3.2.4.2, page 3-12, 2nd paragraph
Several of the statements in this paragraph should be referenced. For example, the text should cite the Federal Register for the sole source aquifer designation for the Snake River Plain aquifer. Scientific studies (not another EIS) should be cited for the amount of water in the aquifer and the source of recharge. **49-13**

Volume 1, Section 3.2.4.2, page 3-12, 3rd paragraph
Perched water bodies at the INEEL are present over relatively small areas of the site that are near surface water bodies or other sources of recharge. If perched water does not occur near ANL-W, then the last two sentences are irrelevant and should be deleted. The statement that "perched water tables tend to slow the migration of pollutants" should reference the original scientific study and not merely reference another EIS. **49-14**

Volume 1, Section 3.2.4.2, page 3-12, 4th paragraph
The EIS should provide a reference for the statement that the "tritium... concentration dropped 93 percent between 1961 and 1994." Also, the contaminant list provided is not all- inclusive. This section should also reference some of the more recent USGS **49-15**

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Response to Commentor No. 49 (Cont'd):

processing compared to the total amount of plutonium (considered surplus plutonium) currently stored at SRS.

49-10: The reference cited by the commentor has been revised. The reference is now DOE 1999a, "Idaho National Engineering and Environmental Laboratory Advanced Mixed Waste Treatment Project Final Environmental Impact Statement," DOE/EIS-290, Office of Environmental Management, Idaho Operations Office, Idaho Falls, Idaho.

49-11: The EIS text was revised to more clearly indicate the availability of the preliminary study of the 100-year peak flow of the Big Lost River. The sentence containing the Abbott, Crockett, and Moor (1997) reference has been deleted. The EIS cites the original scientific study written by Berenbrock and Kjelstrom (i.e., USGS 1998).

49-12: DOE based the affected environment discussions on the Surplus Plutonium Disposition EIS, except where otherwise noted. The discussion of flood diversion facilities is provided in that document, which is readily available to the public, so no additional reference is necessary. It is accepted practice for DOE to cite peer-reviewed, published, and approved DOE documents.

49-13: DOE based the affected environment discussions on the Surplus Plutonium Disposition EIS, except where otherwise noted. The discussion of the Snake River Plain aquifer is provided in that document, which is readily available to the public so no additional reference is necessary. It is an accepted practice for DOE to cite peer-reviewed, published, and approved DOE documents.

49-14: DOE based the affected environment discussions on the Surplus Plutonium Disposition EIS, except where otherwise noted. The discussion of the Snake River Plain aquifer is provided in that document, which is readily available to the public so no additional reference is necessary. It is accepted practice for DOE to cite peer-reviewed, published, and approved DOE documents.

49-15: DOE based the affected environment discussions on the Surplus Plutonium Disposition EIS, except where otherwise noted. A discussion of historical tritium concentrations is provided in that document, which is readily available to the public so no additional reference is necessary. Text in Section 3.2.4.2 was revised to address the migration of waste into the aquifer. The list of groundwater contaminants is intended to show examples of known contaminants and indicate those of primary concern. Text has been added to the this EIS to refer the reader to the annual environmental reports for more information on groundwater monitoring programs.

Commentor No. 49: Kathleen E. Trever (Cont'd)

hydrologic conditions reports for the INEEL (e.g., Bartholomay and others, 1997) for readers who would like more information.

The statement "Components of nonradioactive waste entered the aquifer as a result of past waste management practices" uses the past tense, and consequently is misleading. Nonradioactive wastes continue to migrate to the aquifer at the INEEL. For example, chloride discharged to the percolation ponds at the INTEC migrates rapidly enough that chloride concentrations in groundwater mirror the concentrations in the wastewater (see Bartholomay and others, 1997; p. 36). **49-15 (Cont'd)**

Volume 1, Section 3.2.5, page 3-13, 1st paragraph
References should be provided for the age of the rhyolitic rocks. Also, the last two sentences appear contradictory. Further discussion of sinkhole and lava tube issues is appropriate. **49-16**

Volume 1, Section 3.2.5, page 3-13, 3rd paragraph
The reference given for the statement regarding capable faults (i.e. Abbott, Crockett, and Moor, 1997) is a predecisional draft, which hardly seems appropriate. Reference the *original scientific study*. **49-17**

Volume 1, Section 3.2.5, page 3-13, 4th paragraph
The statement "No earthquakes have been recorded within 48 kilometers of the site" is false. In fact, several small earthquakes have been recorded beneath the INEEL (Jackson and others, 1993). **49-18**

Volume 1, Section 3.2.5, page 3-13, 4th paragraph
"An earthquake with a maximum horizontal acceleration of 0.15 g is calculated to have an annual probability of occurrence of 1 in 5,000 at a central INEEL location." The EIS should list the reference for this important value. **49-19**

Volume 1, Section 3.2.5, page 3-13, 5th paragraph
The statement "most of the basaltic volcanic activity occurred at the Craters of the Moon National Monument 20 kilometers southwest of INEEL between 4 million and 2,100 years ago" is inaccurate. While the most recent volcanism on the Snake River Plain occurred at the Craters of the Moon National Monument, researchers have mapped five volcanic zones on the INEEL. ANL-W lies within one of these, the axial volcanic zone (Hackett and Smith, 1994). Most or all of the basalt flows on the INEEL were derived from these or other local eruptive centers. The text should be revised to discuss the volcanic activity on the INEEL. **49-20**

The text states "The probability of volcanic activity affecting facilities at the INEEL is very low." "Very low" is not quantitative, and thus has no real meaning. A quantitative estimate for volcanism at ANL-W can and should be derived using the data presented

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Response to Commentor No. 49 (Cont'd):

49-16: The reference for the age of the rhyolitic rocks has been added to the EIS, and the two sentences referenced by the commentor have been modified for clarity.

49-17: Although Abbott, Crockett, and Moor (1997) is a predecisional draft, neither a draft or final version of the document will be issued. However, the document will be included in the Administrative Record for the EIS and will, therefore, be available to the public.

49-18: The statement that no earthquakes have been recorded within 48 kilometers (30 miles) of INEEL has been deleted from the EIS and reference to the occurrence of several "microearthquakes" at the site has been added (per Jackson et al. 1993).

49-19: The following reference has been added to the end of the sentence in question. Barghusen, J., and R. Feit, 1995, Technical Report on Affected Environment or the DOE Sites Considered in the DOE Waste Management Programmatic Environmental Impact Statement, META/Berger-SR-01, META/Berger, Gaithersburg, MD, July."

49-20: The referenced paragraph in Section 3.2.5 of the EIS has been revised using Hackett and Smith (1994). Also, reference to the volcanic zone within which ANL-W occurs has been added to the last paragraph of Section 3.2.5 of the EIS.

49-21: Although Abbott, Crockett, and Moor (1997) is a predecisional draft, neither a draft or final version of the document will be issued. However, the document will be included in the Administrative Record for the EIS and will, therefore, be available to the public.

49-22: Information presented in the second through fourth sentences of the referenced paragraph in Section 3.2.5 of the EIS is from ANL 1999a. This reference is provided at the end of the fourth sentence. The last sentence concerning disturbed soils has been retained.

49-23: The socioeconomic region of influence is not determined by proximity, but is defined by the areas where INEEL employees and their families reside, spend their income, and use their benefits, thereby affecting the economic conditions of the region. The region of economic influence was determined to be a four-county area in Idaho (Bonneville, Bingham, Bannock, and Jefferson Counties) in which large populations (94.4 percent) of all INEEL employees reside. The seven-county area used in other INEEL EISs was based solely on proximity and the 80-kilometer (50-mile) radius used to assess health impacts.

Commentor No. 49: Kathleen E. Trever (Cont'd)

in the Hackett and Smith study (1994). The text should present this information, not merely reference another EIS. The last sentence should be deleted and replaced with a detailed discussion in this document. **49-20 (Cont'd)**

Volume 1, Section 3.2.5, page 3-13, last paragraph
The reference given for the statement regarding capable faults (i.e., Abbott, Crockett, and Moor, 1997) is a predecisional draft. The EIS should reference the *original scientific study*. **49-21**

The EIS should provide a reference or topographic map to support the statement that ANL-W lies within a closed basin. **49-22**

The statement "Soils are highly disturbed within developed areas of the site" is intuitive and could be deleted.

Volume 1, Section 3.2.8, page 3-18
The region of influence should be expanded. A seven-county area has been used for other INEEL EISs. Butte County should at least be included, since most of the INEEL site is in Butte County. **49-23**

Volume 1, Section 3.2.11.1, Table 3-10, page 3-25
Because DOE considers the sodium-bearing waste in the INTEC Tank Farm mixed transuranic waste that may be processed in the future at the NWCF, the box opposite "INTEC NWCF" under "Mixed TRU" should contain an "x." Notably, the State of Idaho considers this material to be high-level waste. **49-24**

Volume 1, Section 3.2.11.2, page 3-27, lines 2-4
"Most aqueous solutions...were concentrated by evaporation and separated into low-level radioactive waste streams..." should be changed to say "...separated into low-level and high-level radioactive waste streams...." **49-25**

Volume 1, Section 3.2.11.2, page 3-7, lines 4-11
"This calcination was completed in February 1998." Calcination of non-sodium bearing HLW has been completed, but calcination of sodium-bearing waste has not.

The sentences at the end of this paragraph could be interpreted as indicating that storage tanks are empty. These sentences should be clarified, since about 1.4 million gallons of liquid mixed sodium-bearing waste remain in the INTEC Tank Farm. **49-26**

Volume 1, Section 4.1.2, page 4-3 (and various subsequent discussions of TRU waste)
"Transuranic waste....This waste could be disposed of in the Waste Isolation Pilot Plant." Would the TRU waste resulting from this process be acceptable for disposal **49-27**

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Response to Commentor No. 49 (Cont'd):

49-24: DOE concurs with the commentor, and this table has been revised in the EIS to reflect the change.

49-25: DOE has revised Section 3.2.11.2 of the EIS to be consistent with the information given in the Idaho High-Level Waste and Facilities Disposition Draft EIS.

49-26: See response to comment 49-25.

49-27: All of the transuranic waste generated by the treatment of sodium-bonded spent nuclear fuel would be acceptable for disposal at the Waste Isolation Pilot Plant under current regulations. If necessary, the Advanced Mixed Waste Treatment Facility will treat the waste to meet the Waste Isolation Pilot Plant Waste Acceptance Criteria and applicable requirements of the Toxic Substances Control Act and Resource Conservation and Recovery Act (RCRA) Land Disposal Restrictions.

49-28: For the purposes of evaluation, this EIS assumes that high-integrity can packaging could start as early as 2003. DOE would not begin packaging in high-integrity cans until it receives some indication that high-integrity can packaging would be acceptable under the waste acceptance criteria for the geologic repository and a high-integrity can specification is in place.

49-29: As described in the EIS, the adsorbent used in the off-gas system to collect volatile radionuclides released from spent nuclear fuel when it is heated is considered a high-level radioactive waste. This adsorbent material would be packaged and disposed of similar to other high-level radioactive waste generated under the proposed action. This high-level radioactive waste would be generated at ANL-W (and/or SRS), and would be stored and disposed of in a similar manner to the ceramic and/or metallic waste.

49-30: The text in Table 4-64 was revised to reflect this new information. The information presented in this table, as referenced, came from the Advanced Mixed Waste Treatment EIS released by DOE Idaho Operations in January 1999. DOE recognizes that there will always be other new commercial businesses that contribute to the cumulative impacts in the region. Since the potential incremental effects from the proposed action on the region would be small, it is not necessary to identify each of these new commercial businesses. As explained in Section 4.11.1 of the SBSNF EIS, DOE recognizes there are a number of existing and planned industrial and commercial facilities located in the counties surrounding INEEL, although the EIS does not identify them by name. Because of the distances between

Commentor No. 49: Kathleen E. Trever (Cont'd)

at WIPP under the WIPP Land Withdrawal Act and current regulations, or would legal changes be required for disposal at WIPP? **49-27 (Cont'd)**

Volume 1, Section 4.4, page 4-26
Will geologic repository waste acceptance criteria and specifications for high-integrity cans be established by 2003? This information will be necessary for placement in cans to begin. **49-28**

Volume 1, Section 4.4.6, page 4-33, under the header "Other Associated Process High-Level Radioactive Waste", 1st paragraph; Section 4.5.6, page 4-48; Section 4.6.6, page 4-59; Section 4.7.6, page 4-72; Section 4.8.6, pages 4-82 and 4-83
"...absorbant used in the off-gas system which has collected the volatile radionuclides...." How and where will this material be treated and disposed? **49-29**

Volume 1, Section 4.10.1, Table 4-62, page 4-88
The Target store listed in this table is not a "reasonably foreseeable offsite action." It has been completed and open for business for some time. It is unclear why this store was included in this table and other similar projects were not. For example, other commercial businesses of similar size recently have been or are being constructed in the Idaho Falls area. **49-30**

Volume 1, Section 4.11, page 4-102
"The programmatic considerations presented below is a programmative perspective of the alternatives vis-a-vis the current regulatory environment...." This sentence should be rewritten to be a clear statement. **49-31**

Volume 1, Section 5.1.3, Table 5-1, pages 5-6 and 5-7
DOE Order 435.1 and the associated manual and guidance document are now final. DOE Order 435.1 should be included in the table and its implications fully discussed in the text. Also, the entire SBSNF EIS should be reviewed for consistency with Order 435.1 requirements for radioactive waste management and waste type definitions and modified as necessary. **49-32**

Volume 2, Appendix A, Table A-3, page A-17, 1st item under "Transportation"
"It is DOE's intention to minimize transport of radioactive materials associated with its sodium-bonded spent nuclear fuel inventory wherever possible." This statement should be qualified in the text, since the SBSNF EIS considers alternatives that do <u>not</u> minimize transport. **49-33**

Volume 2, Appendix A, Table A-3, page A-21, 3rd item
Is the sale of low-enriched uranium as feedstock for commercial reactor fuel consistent with the U.S. policy on reprocessing? **49-34**

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Response to Commentor No. 49 (Cont'd):

INEEL and these facilities, there is no opportunity for interaction and no measurable contribution to the cumulative impacts.

49-31: The text cited by the commentor has been revised.

49-32: DOE Order 435.1 has been added to Table 5-1 of the EIS. This DOE Order replaces DOE Order 5820.2A, which was removed from the table. The definitions of radioactive waste materials identified in the EIS are consistent with the definitions used in DOE Order 435.1. The implications of DOE 435.1 are discussed, as appropriate, throughout the EIS.

49-33: DOE considered two alternative locations for the treatment and management of sodium-bonded spent nuclear fuel, INEEL and SRS. SRS was selected in response to the National Research Council's recommendation that only PUREX processing would provide a viable alternative to the electrometallurgical treatment technology. This is consistent with the statement made in Section A.1.3 of Appendix A that DOE would minimize transportation activities "wherever possible." As described in Section 4.9 of the EIS, the environmental impacts of transporting spent fuel to SRS are very small, and are essentially indistinguishable from those associated with local transport at the INEEL site.

49-34: Disposition of DOE's inventory of surplus uranium is not within the scope of this EIS. However, it will be the subject of a future NEPA action.

49-35: The definition of mixed waste in presented in Section B.5.1 of Appendix B has been expanded to indicate that mixed waste could be any radioactive waste that includes hazardous components, i.e., it could be either high-level radioactive, low-level radioactive, or transuranic waste.

49-36: The designation "Other Waste" has been removed from the list of waste types.

49-37: As part of the PUREX processing of spent nuclear fuel, the separated, impure plutonium would go through various cleaning cycles to reduce transuranic contamination. The separated plutonium from the blanket spent nuclear fuel would be considered surplus plutonium.

49-38: Qualifying statements were added to the table to clarify the radiation exposure units.

49-39: The text cited by the commentor has been revised.

49-40: DOE agrees with the commentor. The text has been revised for clarity and omissions. The unit for 0.03 is "g," or acceleration gravity, indicating the peak ground acceleration of the Borah Earthquake.

Commentor No. 49: Kathleen E. Trever (Cont'd)

Volume 2, Section B.5.1, page B-7
The definition of mixed waste (mid-page) should be changed to indicate that high-level and TRU waste can be mixed (as well as low-level waste). **49-35**

All wastes should fit into high-level, TRU, low-level, mixed, hazardous, or non-hazardous waste categories. Management and disposal of "other wastes" would be problematic. **49-36**

Volume 2, Section C.2, page C-6
Why would the plutonium be further purified in a "Second Plutonium Cycle" ? Is it considered to be surplus plutonium? **49-37**

Volume 2, Section E.2.2, Table E-2, page E-9
The table should include units; all impacts are per person-rem. **49-38**

Volume 2, Section E.4.1, page E-15, 1st paragraph, line 5
"Department of Environmental Quality" should be "Division of Environmental Quality." **49-39**

Volume 2, Section F.2.2.1.2, page F-11, 2nd paragraph
This paragraph is not clearly written and is hard to follow. Also, what are the 0.03 units referred to in "all major systems are known to have survived the 0.03 Borah earthquake..."? **49-40**

Volume 2, Section F.2.2.1.3, page F-24, 1st paragraph
"The location of the F-Canyon facility is far away from any airport...." A distance should be listed to quantify "far away." **49-41**

Volume 2, Section G.5.5, page G-16
"(ANL 1994)" A more recent reference for vehicle accident and fatality rates is Saricks, C. L. and M. M. Tompkins, 1999, State-Level Accident Rates of Surface Freight Transportation: A Re-Examination, ESD/TM-150, Argonne National Laboratory, Argonne, Illinois. **49-42**

Volume 2, Section G.5.6.2, 1st line
"The release fractions for were taken from...." The missing word between "for" and "were" should be provided. **49-43**

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Response to Commentor No. 49 (Cont'd):

49-41: DOE Standard 3014-96 discusses the distances from where a facility could be affected by takeoff and landing accidents. F-Canyon is located outside the farthest distance identified in the standard, more than 40 kilometers (25 miles) away from a major commercial airport. A clarification was added to the text.

49-42: The new transportation accident frequencies from this reference have been incorporated into the EIS.

49-43: The text in section G.5.6.2 of Appendix G has been revised for clarity.

Commentor No. 49: Kathleen E. Trever (Cont'd)

REFERENCES TO COMMENTS

Bartholomay, R.C., B.T. Tucker, D.J. Ackerman, and M.J. Liszewski, 1997. Hydrologic conditions and distribution of selected radiochemical and chemical constituents in water, Snake River Plain aquifer, Idaho National Engineering Laboratory, Idaho, 1992 through 1995: U.S. Geological Survey Water-Resources Investigations Report 97-4086 (DOE/ID-22137), 57 p.

Berenbrock, C., and L.C. Kjelstrom, 1998, Preliminary water-surface elevations and boundary of the 100-year peak flow in the Big Lost River at the INEEL, Idaho: U.S. Geological Survey Water-Resources Investigations Report 98-4065 (DOE/ID-22148), 13 p.

Hackett, W.R., and Smith, R.P, 1994, Volcanic hazards of the Idaho National Engineering Laboratory and adjacent areas: INEL-94/0276, 31 p.

Jackson, S.M., I.G. Wong, G.S. Carpenter, D.M. Anderson, and S.M. Martin, 1993, Contemporary seismicity in the eastern Snake River Plain, Idaho based on microearthquake monitoring: Bull. Seis. Soc. of Amer., v. 83, no. 3, pp. 680-695.

Should you have any questions regarding these comments, please contact Robert Guenzler at (208) 528-2600.

Sincerely,

Kathleen E. Trever

Kathleen E. Trever
Coordinator-Manager

KET/ds

Response to Commentor No. 49 :

Commentor No. 50: Bennett Ramberg

COMMITTEE TO BRIDGE THE GAP
1637 BUTLER AVENUE, SUITE 203
LOS ANGELES, CALIFORNIA 90025
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September 27, 1999

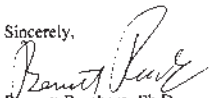
Susan Lesica
NE-40
U.S. Department of Energy
19901 Germantown Rd.
Germantown, MD 20874

Dear Ms. Lesica:

Enclosed please find comments on the Draft EIS for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel.

Thank you for your consideration.

Sincerely,



Bennett Ramberg, Ph.D.
Director of Research

Response to Commentor No. 50:

Commentor No. 50: Bennett Ramberg (Cont'd)

Comments Submitted by
Bennett Ramberg, Ph.D.
Director of Research,
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Los Angeles, CA 90025
310 478-0829

On the "Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel"

According to the dictionary, a "contortionist" is one who can twist his body into unnatural positions. Reading the "Nonproliferation Impacts Assessment for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel" (NIA)--an addendum to the "Draft Environmental Impact Statement for The Treatment and Management of Sodium-Bonded Spent Nuclear Fuel" (DEIS)--one comes away with the feeling that the Department of Energy (DOE) has adopted a contortionist's rationalization of reprocessing of spent nuclear fuel at the Argonne National Laboratory-West. (ANL-W). In so doing, the authors challenge a foundation of U.S. nuclear nonproliferation policy while laying the basis for implementation of more proliferation resistant actions.

In the commentary that follows, I intend to raise serious questions about the impact of EMT on the U.S. government's nuclear nonproliferation policy. In support of my concerns, I have enclosed the declarations of leading experts that appeared in litigation brought to halt the the Argonne National Laboratory-West's Electromeallurgical Treatment Research and Demonstration Project.

50-1

The following NIA "conclusion" provides a point of departure to illustrate the problem: "All but one alternative--the one involving PUREX reprocessing at SRS--are *fully consistent* with U.S. policy with respect to reprocessing and nonproliferation." (Page ES-7; emphasis added.) Note, however, that on page ES-6, DOE qualifies this affirmation declaring that the "consistent" alternatives "have the potential to raise limited concerns." In this Clintonesque word game, it is difficult to quantify how "limited" "limited concerns" are.

The report provides evidence that "concerns" are more than limited. On page ES-6 the authors note that EMT "could cause countries to question the U.S. commitment against reprocessing and *provide encouragement* for the expansion or initiation of reprocessing programs in other countries." (emphasis added) This is a curious consequence for a program that DOE purports to be "consistent "with Washington's nonproliferation policy. The body of the NIA supports this skepticism.

Response to Commentor No. 50:

50-1: The assessment of nonproliferation impacts is not part of the scope of the EIS. As stated in the Nonproliferation Impacts Assessment the alternatives involving PUREX reprocessing and broad application of electrometallurgical treatment of both driver and blanket fuel have a greater potential to provide encouragement to other countries to engage in plutonium reprocessing. Given the small quantity and unique characteristics of the sodium-bonded spent nuclear fuel and the reason for the treatment, however, such encouragement, if any, would be limited. Sodium-bonded spent nuclear fuel represents approximately 2 percent of the DOE's spent nuclear fuel inventory.

Commentor No. 50: Bennett Ramberg (Cont'd)

The contortions manifest early in the defense of EMT when the NIA cites ANL-W's contention, namely that IFR pyroprocessing "was designed to be 'proliferation resistant.'" (Page 3-4.) The NIA itself subsequently casts doubt citing no less and authority than the National Academy of Sciences: "Although the developers of the electrometallurgical technique argue that the technology is proliferation resistant, any [spent nuclear fuel] processing approach that is capable of separating fissionable materials from associated fission products and transuranic elements could be redirected to produce materials with nuclear detonation capability." (Page 3-5)

The contortions continue in another direction when the NIA concludes on page 3-8 that EMT in its "current equipment configuration" is incapable of producing weapons useable plutonium. At the same time DOE--echoing the National Academy of Sciences--concedes that "additional steps" could be taken to permit the procurement of weapons useable plutonium. In this regard the NIA notes that the compact EMI process allows for a "more concealed plutonium purification process." (Page 3-14.) It acknowledges that EMT will extract weapons-useable HEU. On page 3-14 the authors note diversion scenarios for both nuclear weapons useable materials.

Before proceeding into a comparative evaluation of spent fuel treatment alternatives, the NIA strains to distinguish EMT from reprocessing. Civil reprocessing has been contrary to public policy since the Ford Administration. The Clinton Administration has drawn an artificial line declaring that reprocessing refers solely to the extraction of plutonium. This is contrary to the common definition of reprocessing which is the separation of spent fuel into its constituent parts. (See the critical reviews of how reprocessing has been represented at ANL-W in Attachments 1 and 2 by Thomas Cochran, Ph.D. and Professor Albert Wohlstetter, Ph.D., respectively.)

Recognizing the dilemma, the authors engage in remarkable contortions attempting to suggest that EMT is not reprocessing. In this view, "Because EMT is not capable of separating plutonium from fission products, it cannot be considered plutonium reprocessing." In the same paragraph, however, the NIA concedes that "separation of weapons-usable plutonium is possible using a modified EMT electrorefiner in a hybrid system." With regard to HEU, the authors concede that extraction from spent fuel is "reprocessing": "EMT does recover HEU from HEU-containing spent nuclear fuel, similar to other DOE reprocessing facilities such as the Idaho Chemical Processing Plant and the

50-1

Response to Commentor No. 50:

Commentor No. 50: Bennett Ramberg (Cont'd)

H-Canyon facility at the Savannah River Site (SRS), and for that reason, EMT could be recognized as a reprocessing technology." (Page 3-15.)

As a result of this the NIA concludes, "Because of the similarities between EMT and conventional reprocessing, in particular the ability of EMT to recover HEU and the role of the EMT electrorefiner in a potential hybrid plutonium recovery process, both domestic and export applications of EMT pose concerns with respect to U.S. nonproliferation policy." (Page 3-15.) The authors punctuate this point on page E-16 noting, "*Except in cases where EMT exhibits a decisive advantage (e.g., in security, cost, environmental, or health and safety) over other alternatives, the use, export, development, or promotion of this technology could cause countries to question the U.S. commitment against reprocessing. Closely scrutinizing proposals for applying EMT (and similar fissile material separations technologies) will help mitigate this issue.*" (italics included) This is a peculiar conclusion for a technology that DOE contends is "consistent" with nonproliferation. Furthermore the authors fail to define what "scrutiny" is required to address their concerns.

All this is prolog to a curious comparative evaluation of the proliferation resistance of various sodium bonded spent fuel disposal alternatives. The Department of Energy argues that save for PUREX, all remaining alternatives are "acceptable in terms of nonproliferation risk." (Page ES-6.) However, Chapter 6's assessment demonstrates quite the contrary: some alternatives are clearly less risky than others and, it is not at all clear, as the report concludes, that the benefits of some are simply "marginal." (Page ES-6.)

50-1

Table 6-1 provides a point of departure. The authors indicate that in four categories EMT "could raise proliferation concerns." The text provides elaboration repeating concerns raised elsewhere. DOE concedes that it is difficult to assure application of international safeguards to EMT because bulk processing of nuclear material and separation of fissile material. Furthermore,

> "The similarities between EMT and conventional reprocessing would have somewhat greater potential to encourage reprocessing in other countries than would the high-integrity cans or melt and dilute options. This potential stems primarily from its ability to produce weapons-useable HEU and the historical origins of EMT as part of the IFR breeder fuel-cycle technology, which can be perceived as having several parallels to the PUREX technology used worldwide to process spent nuclear fuel. Extending the time that U.S. separations facilities operate and using a separations process to prepare spent nuclear fuel for geological disposal (while at

Response to Commentor No. 50:

Commentor No. 50: Bennett Ramberg (Cont'd)

the same time acknowledging that the fuel does not pose near-term safety and health vulnerabilities and that such processing technically is not required) could serve to undermine U.S. credibility in expressing concern to other countries about the proliferation problems associated with conventional reprocessing in the nuclear fuel cycle." (Page 6-4.)

The authors then proceed to rationalize EMT through a serious of contortions as the paragraph continues. They argue the technology is not intended to extract plutonium. Note however that the paragraph concedes that EMT has parallels to PUREX which is a plutonium reprocessing technology. The report then argues that EMT is necessary to address the "unique chemical reactivity requirements of the highly unusual type of spent fuel." However, the authors grant that other technologies which do not require reprocessing can cope with the challenge. A third defense of EMT argues that the technology intends to prepare the fuel for disposal rather than breeding. This is a *non sequitur*; with the conclusion of operations at EBR II, there is no breeder program in the United States. Finally, the authors acknowledge that that EMT would challenge verification under the Fissile Material Cutoof Treaty.

Were EMT the only alternative apart from PUREX, perhaps a case could be made for its application. However the NIA reports alternatives. High Integrity Cans for blanket assemblies and Melt and Dilute both reduce the proliferation challenge. The No Action alternative, defers the problem for an interim period. (In Attachment 3, Professor Frank von Hippel, Ph.D. argues that there is no urgency to treat the spent fuel at ANL-W.) Indeed, No Action allows time for development of "less mature" proliferation resistant technologies mentioned in the NIA and the DOE/EIS, e.g. GMODS and plasma arc methods. (Pages 6-9 of the NIA and S-23 and 2-31 of the DEIS. See also Professor James Warf, Ph.D., Attachment 4, on alternatives to extract sodium from the spent fuel without reprocessing.)

The NIA's demonstration that practical alternatives exist that do not bear the proliferation onus of EMT, coupled to others in development, begs the following questions: Why is EMT being promoted? Why has DOE engaged in the noted contortions? Why can't DOE await the maturation of promising technologies under development which do not raise the proliferation specter?

In conclusion, the foregoing analysis demonstrates that EMT is contrary to the "major principals" laid out in the September 27, 1993 White House "Nonproliferation and

50-1

Response to Commentor No. 50:

Commentor No. 50: Bennett Ramberg (Cont'd)

Export Control Policy Statement" which declares "Our national security requires us to accord higher priority to nuclear nonproliferation." The application of EMT, which DOE acknowledges is reprocessing and could "provide encouragement" for reprocessing in other countries, is clearly inconsistent with the "Statement." Accordingly, DOE should halt the application of EMT without delay.

50-1

Attachments

Attachment 1: Declaration of Thomas B. Cochran, Ph.D.

Attachment 2: Declaration of Albert Wohlstetter, Ph.D.

Attachment 3: Declaration of Frank Von Hippel, Ph.D.

Attachment 4: Declaration of James C. Warf, Ph.D.

Response to Commentor No. 50:

Commentor No. 51: Charles Rice

Citizens Advisory Board

Idaho National Engineering and Environmental Laboratory

99-CAB-099

September 28, 1999

Susan Lesica
NEPA Document Manager
U.S. Department of Energy
Office of Nuclear Facilities Management
Office of Nuclear Energy Science, and Technology, NE-40
19901 Germantown Road, Germantown, Maryland 20874-1290,

Attention: DOE/EIS-0306

Dear Ms. Lesica:

> Note: The Site-Specific Advisory Board (SSAB) for the Idaho National Engineering and Environmental Laboratory (INEEL), also known as the INEEL Citizens Advisory Board (CAB), is a local advisory committee chartered under the Department of Energy's (DOE) Environmental Management SSAB Federal Advisory Committee Act Charter.

The Idaho National Engineering and Environmental Laboratory Citizens Advisory Board (INEEL CAB) reviewed the *Draft Environmental Impact Statement (EIS) for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel* and two companion documents, the *Cost Study of Alternatives Presented in the Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel* and the *Nonproliferation Impacts Assessment for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel*.

The enclosed recommendation, INEEL CAB Recommendation #64, conveys the INEEL CAB's comments on the three documents. The recommendation was reached through consensus at our September 1999 meeting. I might add that we appreciated your willingness to extend the public comment period to allow our participation.

We await your response to this recommendation.

Sincerely,

Charles M. Rice
Chair, INEEL CAB

Chair:
Charles M. Rice

Vice Chair:
Stanley Hobson

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Response to Commentor No. 51:

Commentor No. 51: Charles Rice (Cont'd)

cc: Dieter Knecht, INEEL CAB Spent Nuclear Fuel Committee Chair
Beverly Cook, DOE-ID
Greg Bass, DOE-Chicago
Carolyn Huntoon, DOE-HQ
Bill Magwood, DOE-HQ
Martha Crosland, DOE-HQ
Fred Butterfield, DOE-HQ
Larry Craig, U.S. Senate
Mike Crapo, U.S. Senate
Mike Simpson, U.S. House of Representatives
Helen Chenowith, U.S. House of Representatives
Laird Noh, Chair, Idaho Senate Resources and Environment Committee
Golden C. Linford, Chair, Idaho House of Representatives Resources and Conservation Committee
Jack Barraclough, Chair, Idaho House of Representatives Environmental Affairs Committee
Gerald Bowman, DOE-ID
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Response to Commentor No. 51 (Cont'd):

Commentor No. 51: Charles Rice (Cont'd)

Citizens Advisory Board
Idaho National Engineering and Environmental Laboratory

Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

The Idaho National Engineering and Environmental Laboratory Citizens Advisory Board (INEEL CAB) has reviewed the *Draft Environmental Impact Statement (EIS) for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel* and two companion documents, the *Cost Study of Alternatives Presented in the Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel* and the *Nonproliferation Impacts Assessment for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel*. This recommendation, reached through consensus, presents our comments on the three documents.

During the scoping period for this EIS, the INEEL CAB recommended that DOE consider the possibility of using different treatment processes for the driver fuel and the blanket fuel. **We commend DOE for taking that recommendation to heart.** We also feel that DOE was responsive to other recommendations we made during the scoping period, including requests for (1) a listing of all assumptions and (2) bounding estimates of shipments in and out of Idaho and estimates of storage duration(s). The following recommendations address our prior recommendations that were less well addressed and other concerns that arose during review of the draft EIS.

51-1

During the scoping period for this EIS, the INEEL CAB recommended that DOE evaluate the impacts of additional alternatives. We appreciate that DOE accepted that recommendation. **The INEEL CAB recommends that DOE give more consideration to the Glass Material Oxidation and Dissolution System and the Direct Plasma Arc-Vitreous Ceramic Treatment process in the Final EIS.**

51-2

The INEEL CAB recommends that DOE construct one more alternative and evaluate the impacts of that alternative in the Final EIS. The additional alternative should entail taking no action for the driver fuel. The components of this additional alternative are presented in other alternatives considered. Presentation of the impacts of these components separately (in different configurations) does not allow the public to evaluate this particular combination. This alternative would allow DOE more time to develop other non-separation technologies for possible treatment of the driver fuel and to allow further development work to determine the feasibility of removing sodium from the driver fuel (which would thereby allow disposal in High Integrity Cans). The INEEL CAB is not recommending selection of this additional alternative at this time, but would like to evaluate the impacts of such an alternative in comparison with those presented in the EIS.

51-3

During the scoping period for this EIS, the INEEL CAB recommended that relevant documents be made available during this comment period to support an informed public review of the Draft EIS. We were pleased to receive the *Cost Study of Alternatives Presented in the Draft*

51-4

RECOMMENDATION # 64 September 28, 1999
Page 1

Response to Commentor No. 51 (Cont'd):

51-1: DOE appreciates the commentor's commendation. DOE revised the scope of the EIS based on comments provided during the public scoping period.

51-2: The reasons why DOE dismissed the GMODS and direct plasma arc-vitreous ceramic treatment processes from its list of reasonable alternatives are provided in Section 2.6 of the EIS. There has been no new information since issuance of the draft EIS to change this position. Should DOE decide to take no action and wait for the development of a technology such as GMODS or the plasma arc process in its Record of Decision, additional NEPA documentation would be required to assess the impacts from the use of such technologies.

51-3: The environmental assessment of Alternatives 2, 3, 4, and 5 in Chapter 4 of the EIS presents the impacts from treatment of the driver and blanket sodium-bonded spent nuclear fuel separately. Conclusions on the environmental impacts of the alternative suggested by the commentor can be easily drawn, especially since the environmental impacts for all alternatives, including no action, are small and have been shown to not be a discriminator between alternatives. As discussed in Section 2.5 of the EIS, DOE will consider combinations of technologies, options, and fuel types, including combinations not included among the specific combinations considered in the EIS, in reaching its decision.

51-4: The National Academy of Sciences' National Research Council prepared nine reports on the electrometallurgical treatment technology that have been reviewed by DOE. These reports are located in the public reading rooms. The National Research Council completed its review of the electrometallurgical treatment technology in September 1999, and the final summary report on the Electrometallurgical Treatment Research and Demonstration Project was published in April 2000. DOE will consider the findings in this final report in determining the technical risk associated with the electrometallurgical technology alternatives in the EIS. Technical risk will be a factor in preparing the Record of Decision, which is scheduled for completion no sooner than 30 days after publication of the final EIS. Data generated during the demonstration project were used in preparing this EIS. Although NEPA does not provide for public hearings and a formal comment period following the issuance of a final EIS, the public is free to comment on the final document prior to publication of the Record of Decision.

51-5: Actual costs for treating and managing sodium-bonded spent nuclear fuel are not part of the EIS process. However, the Cost Study states that

Commentor No. 51: Charles Rice (Cont'd)

Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel and the *Nonproliferation Impacts Assessment for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel*. Two other important and relevant studies still underway should have bearing on the decisions that this EIS will support. Inasmuch as the Draft EIS places primary emphasis on electrometallurgical treatment technology, the not-yet-reported electrometallurgical treatment demonstration project and the pending National Research Council's review of the electrometallurgical treatment process appear relevant. We regret that our review of the Draft EIS is less well informed than desired because the results of those two studies are not yet available. **The INEEL CAB recommends that DOE enhance public participation in this environmental review by allowing subsequent public comment period(s) once the other studies are available for public review.**

51-4 (Cont'd)

The *Cost Study of Alternatives Presented in the Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel* presented relevant data on the alternatives considered in the Draft EIS. We noted, however, numerous apparent discrepancies and possible inaccuracies in the cost data presented. Such discrepancies and inaccuracies confuse the reader.

For example, Section 2.2 2 (pages 2-3 through 2-5) and Table 2-3 (on page 2-5) summarize costs associated with Alternative 1 by various cost elements. The text in Section 2.2.3 (on page 2-4) and the table both state that the net present value (in millions of Year-2000 dollars) for one cost element—waste form qualification at Argonne National Laboratory - West—would be $52 million. The cost estimate presented on Table 2-3 for another cost element—disposal fees for high-level radioactive waste—differs from the dollar value presented in the text, however. According to the table, disposal of high-level radioactive waste would cost $47 million; the text in Section 2.2.4 reports that the "repository fee" for 135 high-level radioactive waste disposal canisters would be "about $64 million" in 2015. There is no explanation for the difference between the two numbers. **The INEEL CAB recommends that DOE revise the cost study and that all cost estimates be presented in a readable and understandable form to support informed public review of environmental documentation.**

51-5

The INEEL CAB supports U.S. goals regarding nonproliferation. We recommend that DOE base decisions related to the management of sodium bonded spent nuclear fuel on a sound analysis of the potential nonproliferation impacts.

The members of the INEEL CAB differ significantly with regard to their opinions and perspectives on the current U.S. policy regarding reprocessing. As a result, we were unable to reach consensus on a recommendation regarding any particular alternative at this time. Those who support the current U.S. policy against reprocessing may not be able to support any alternative involving separations. Those who do not support the current policy may support alternatives involving separation technologies. Because we believe we represent the range of public opinions on this topic, the INEEL CAB appreciates DOE's current dilemma.

51-6

Response to Commentor No. 51 (Cont'd):

$47 million is the net present value of the disposal fee in 2000, i.e., the year 2000 value of the $64 million paid in the year 2015. In Section 1.4 of the Cost Study, the nominal escalation rate is defined to be 2.8 percent and the official discount rate provided by the Office of Management and Budget is 4.9 percent. The numbers are, therefore, consistent as stated. On page 1-7, the Cost Study explains the methodology used. Annual operating costs are provided in nominal, current year estimates except where life-cycle costs are noted.

51-6: The assessment of nonproliferation impacts is not part of the scope of the EIS. However, DOE's Office of Arms Control and Nonproliferation assessed the potential nonproliferation impacts that may result from each of the alternatives and technologies analyzed in this EIS. This analysis is presented in the Nonproliferation Impacts Assessment, which states that, for this specific application, all alternatives except PUREX processing at SRS are fully consistent with U.S. policy on reprocessing and nonproliferation. DOE welcomes public comments on nonproliferation issues and has received and responded to many comments on these issues during the public comment period on the draft EIS.

51-7: The SBSNF EIS was prepared in accordance with Council on Environmental Quality regulations (40 CFR 1500-1508) and DOE's NEPA-related regulations (10 CFR 1021) and procedures. As explained in the introduction to the EIS, the purpose of the EIS is to assess reasonable alternatives for the treatment and management of sodium-bonded spent nuclear fuel. As part of this assessment, as noted by the commentor, the EIS lists and describes the assumptions and methodologies used to evaluate environmental impacts. These assumptions and methodologies are consistent with the assumptions used in other related DOE EISs. The "related EISs" alluded to by the commentor, which are interdependent parts of a larger action as outlined in the Record of Decision for the Programmatic Spent Nuclear Fuel EIS (60 FR 28680), have been incorporated by reference and used, as appropriate, in the SBSNF EIS (see 40 CFR 1508.25(a)1(iii)). As a result of their publication, discussions on data and assumptions presented in the Yucca Mountain Draft EIS and the Idaho High-Level Waste and Facilities Disposition Draft EIS in particular have been expanded in the SBSNF EIS. The contributory effects of these other ongoing related NEPA actions at INEEL and SRS are evaluated as part of the cumulative impacts analysis for those sites (see Section 4.11 in the EIS). DOE acknowledges the commentor's opinion that the public deserves an assessment of data and assumptions to ensure consistency

Commentor No. 51: Charles Rice (Cont'd)

The INEEL CAB recommends that DOE support vigorous debate regarding the environmental impacts of reprocessing, as well as the potential for terrorist or rogue military use of nuclear materials.

51-6

During the scoping period for this EIS, the INEEL CAB recommended that DOE include a list of all assumptions that provide the basis for the assessment of impacts associated with the various alternatives. While the Draft EIS provided a list of all assumptions, the INEEL CAB recommends that more information be provided on common data and planning assumptions used in related EISs and other environmental documentation. Our recommendation was not adequately addressed by simply providing the title and contents of other ongoing analyses. The public deserves an assessment of the data and assumptions to assure consistency and compatibility with other proposed actions.

51-7

During the scoping period for this EIS, the INEEL CAB recommended that the EIS describe how each alternative would address the waste acceptance criteria for resulting waste products destined for disposal at current and planned disposal facilities. In response to that recommendation, the Draft EIS states that existing preliminary criteria for spent fuel and high-level waste have been developed by DOE's Office of Civilian Waste Management and that the final criteria will be established by the Nuclear Regulatory Commission (NRC). The reference document cited in the draft EIS was the "Civilian Radioactive Waste Management System - Waste Acceptance System Requirements Document (WASRD), DOE/RW-0351, 1998." We note that the WASRD was revised in April 1999 to add criteria for high-level waste glass and for plutonium ceramic glass composite in addition to criteria for spent nuclear fuel and high-level waste. **The INEEL CAB recommends that the Final EIS be revised to incorporate the revised WASRD.**

51-8

The INEEL CAB further recommends that DOE begin to address the requirements that will be imposed by the waste acceptance criteria before the NRC licensing process begins. We understand that the criteria for the high-level waste glass and the plutonium ceramic glass composite (as incorporated in the current revised WASRD under Section 4.2.3.1 "Specific Acceptance Criteria for HLW") were developed in response to input regarding the likely characteristics of those waste forms. **The INEEL CAB recommends that DOE work to develop preliminary waste acceptance requirements for the wastes that will result from the treatment selected in the Record of Decision (ROD) for this EIS as soon as the ROD is issued.** In that manner, the characteristics of the likely wastes will be incorporated into future revisions of the WASRD before NRC develops the final waste acceptance criteria.

51-9

The INEEL CAB concluded that the Summary to the Draft EIS was overly brief and did not provide adequate explanations for the various alternatives evaluated nor for the impacts of those alternatives. We noted that the handout materials (provided at the public comment meetings on the Draft EIS) summarizing the alternatives and the impacts of those alternatives were reader-friendly and easily understood. **The INEEL CAB recommends greater reliance on reader-friendly formats in the Final EIS to help the public understand the information being presented.**

51-10

Response to Commentor No. 51 (Cont'd):

and compatibility with other proposed actions; however, a separate assessment beyond that already presented in the EIS is beyond the scope of this EIS.

51-8: As noted in both versions of the "Civilian Radioactive Waste Management System - Waste Acceptance System Requirements Document (WASRD), DOE/RW-0351, April 1999," the DOE spent nuclear fuel addressed by the Waste Acceptance System Requirements Document does not include the metallic sodium-bonded fuel addressed in the SBSNF EIS "which are candidates for treatment or processing prior to disposal." The EIS has been revised to identify the April 1999 version of the Waste Acceptance System Requirements Document. The analyses and results presented in the SBSNF EIS are not affected by the criteria identified by the commentor for high-level radioactive waste glass, plutonium ceramic glass composite, spent nuclear fuel, and other forms of high-level radioactive waste. DOE will determine the final waste acceptance criteria after the U.S. Nuclear Regulatory Commission issues its construction authorization, based on the successful demonstration of the safe, long-term performance of the repository in accordance with the U.S. Nuclear Regulatory Commission regulations.

51-9: The commentor's recommendation is noted. As stated in Section 2.7 of the EIS, DOE is actively working to develop final waste acceptance requirements for the waste discussed in this EIS. DOE expects the waste that would result from the alternatives analyzed in the EIS would be acceptable in a geologic repository.

51-10: DOE acknowledges the commentor's recognition of the usefulness of reader-friendly formats. The Summary to the EIS has been revised to incorporate a more reader-friendly format in illustrating the types of sodium-bonded spent nuclear fuel, the proposed action and alternatives, and the overall conclusions of potential environmental impacts presented in the handout materials.

Commentor No. 52: Edwin Lyman

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Comments on the Department of Energy's
Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

Nuclear Control Institute
September 28, 1999

The Nuclear Control Institute (NCI) appreciates the fact that the approach of the *Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel* (SBDEIS) differs from that described in the Notice of Intent (NOI), and appears to reflect some of the comments made by NCI and others on the NOI.

In particular, the overall structure and title were changed so that electrometallurgical treatment (EMT) of the sodium-bonded spent nuclear fuel (SBSNF) could be evaluated on a more equal footing with the other treatment alternatives, including high-integrity canisters (HIC) and melt-and-dilute. **52-1**

Also, the physical differences between the blanket and driver SBSNF assemblies were explicitly acknowledged, permitting the development of alternatives which utilize different approaches for the two types of fuel. (In this regard, we commend DOE for locating the documentation associated with the mechanical decladding and sodium removal of 7000 EBR-II blanket fuel in the 1980s that was reported to be missing at the NOI scoping hearing.) The wisdom of the approach has been confirmed by DOE's acknowledgment that "alternative technologies may have certain advantages (e.g. cost) for some or all fuel" (SBDEIS, Vol. I, pg. 2-41), and the fact that EMT of the entire SBSNF inventory has not been designated as the preferred alternative, as the NOI had envisioned. **52-2** **52-1**

Nonetheless, the SBDEIS, as well as the supporting cost and non-proliferation assessment documents, contain fundamental deficiencies and are utterly inadequate to the task of helping to determine a management approach for SBSNF which minimizes damage to the environment and to U.S. non-proliferation credentials. These deficiencies can be attributed in part to the relatively short time taken to produce these documents. We are greatly concerned by reports that the EIS process for SBSNF is being rushed so that funding can continue to flow to EMT development at Argonne National Laboratory (ANL)-West and the research team can be kept together. There **52-3**

Strategies for stopping the spread and reversing the growth of nuclear arms.
Paul L. Leventhal, *President*, Peter A. Bradford, David Cohen, Julian Keenig, Sharon Tanzer, Roger Richter, Dr. Theodore B. Taylor
BOARD OF DIRECTORS

Response to Commentor No. 52:

52-1: The commentor's appreciation is noted. DOE revised the scope of the EIS based on comments provided during the public scoping period.

52-2: DOE appreciates the commentor's commendation.

52-3: The timing for this action is a programmatic issue rather than a safety issue. The SBSNF EIS was prepared in accordance with Council on Environmental Quality regulations (40 CFR 1500-1508) and DOE's NEPA-related regulations (10 CFR 1021) and procedures. Every effort was made to prepare an EIS that is complete and understandable. Further supporting documentation, such as the Cost Study and the Nonproliferation Impacts Assessment, is referenced and is available in DOE's public reading rooms. DOE is committed to improving its environmental management practices, to operating its facilities in a manner that meets or exceeds all applicable environmental, safety, and health requirements, and to cleaning up its environmental problems. The focus of the SBSNF EIS is to assess the potential environmental and health impacts associated with the treatment and management of sodium-bonded spent nuclear fuel. Although not final, the latest guidance provided by DOE's Office of Civilian Waste Management in their "Waste Acceptance System Requirements Document," Revision 3, April 1999 (see Section 4.12.1 of the EIS), indicates that it is highly probable that sodium-bonded spent nuclear fuel would not be acceptable in the repository without some stabilization and/or removal of the metallic sodium. The stabilization of the spent nuclear fuel and/or removal of the metallic sodium will provide greater protection of human health and the environment. Having completed the Electrometallurgical Treatment Research and Demonstration Project (see Section 1.6.3) and in planning the closure of its PUREX processing capabilities, DOE now needs to decide whether these processes are suitable for treating the remaining sodium-bonded spent nuclear fuel, or whether there is sufficient reason to delay a decision and wait for the development of other treatment technologies. Delaying the EIS could result in a loss of capability and of experienced, knowledgeable technical staff should DOE decide at a later date to use the electrometallurgical process to treat sodium-bonded spent nuclear fuel. Section 1.2 of the EIS has been revised for clarification. It is also worth noting that DOE has conducted four independent nonproliferation assessments of the electrometallurgical treatment technology over the last 11 years. These assessments have found the electrometallurgical treatment technology to be in accordance with U.S. nuclear nonproliferation policy for this specific application, and have concluded that electrometallurgical treatment is not capable of separating plutonium in a form that would be

is no safety justification for making a hasty decision on such an important issue. 52-3 (Cont'd)

Comments on the *Draft EIS*

1. The need for EMT of the driver fuel has not been demonstrated.

The main problem with the SBDEIS is that it does not provide sufficient evidence that the SBSNF inventory will pose unacceptably high environmental risks if directly disposed of in a geologic repository. Without convincing evidence of this nature, it is not possible to conclude that the costs and risks of going forward with EMT are justified. At a minimum, to make a convincing case, DOE would have to show all three of the following:

1. Long-term chemical durability tests of SBSNF elements under repository-like conditions indicate that (a) the release rates of radionuclides are significantly greater than those of the proposed EMT waste forms or those of the much larger quantities of commercial SNF, vitrified high-level wastes and metallic uranium fuel (i.e. N-Reactor fuel) that will be placed in the repository; and/or (b) the presence of metallic sodium and uranium in the fuel results in chemical reactions of sufficient violence to cause significant structural damage to the repository, prolonged excessive heating or other undesirable changes. 52-4

2. The enhanced release of radionuclides, either directly from the SBSNF or indirectly as a result of damage to other waste forms in the repository, as well as other deleterious effects resulting from energetic chemical reactions, have significant impacts on the ability of the geologic repository to meet the regulatory performance criteria.

3. There are no technical remedies that could be applied to direct disposal of the SBSNF (i.e. local addition of a chemical buffer or special backfill) that could mitigate the risks associated with the presence of metallic sodium or uranium.

The SBDEIS contains no evidence along these lines, but merely asserts that the SBSNF might pose problems or "could complicate the process of certification of the SNF for disposal." This certification may well be complicated, but the cost and difficulty associated with certification must be compared to that which would be incurred by electrometallurgical treatment of this fuel.

Therefore, a variant of Alternative 2 should be considered in which the blanket fuel elements are mechanically declad and placed in high-integrity cans and the driver fuels are disposed of in high-integrity cans without any processing. The incremental impact of this option on repository performance compared to Alternative 2 should be evaluated. 52-5

2. Inconsistencies in the data must be corrected. 52-6

There are numerous inconsistencies in the technical data presented in the SBDEIS.

2

suitable for weapons production. DOE, in the Record of Decision, will take into account many factors besides this EIS and its supporting documents, including ongoing DOE programs, missions, and related, relevant NEPA actions. The commentor's opinion that the EIS and supporting documents may be deficient in supporting a decision is noted. DOE is confident that a sufficient amount of time was devoted to the preparation of this EIS and its associated documents.

52-4: As stated in the introduction to the EIS, the programmatic risk associated with implementing any of the potential alternatives for the treatment and management of sodium-bonded spent nuclear fuel, or with not treating this fuel, is the uncertainty surrounding the acceptability of DOE spent nuclear fuel for placement in a potential geologic repository. Although not final, the latest guidance provided by DOE's Office of Civilian Waste Management in its "Waste Acceptance System Requirements Document," Revision 3, April 1999 (see Section 4.12.1 of the EIS), indicates it is highly probable that sodium-bonded spent nuclear fuel would not be acceptable in a geologic repository without some stabilization and/or removal of the metallic sodium. The points raised by the commentor are the major reasons for uncertainties about the acceptability of this fuel. Performance of sodium-bonded spent nuclear fuel in a geologic repository depends on many factors (e.g., long-term fuel integrity, repository environment fuel/waste package survivability) and the presence of metallic sodium would complicate the modeling even further. Stabilization of the spent nuclear fuel and/or removal of the metallic sodium would provide greater protection for human health and the environment.

52-5: The alternative suggested by the commentor is similar, if not identical, to the direct disposal option of the No Action Alternative, which is evaluated in Section 4.2 of the EIS. It is not clear whether the commentor suggests the sodium is or is not removed before the blanket fuel elements are placed in high integrity cans. In either case, it is not the intent of this EIS to analyze the performance of a repository that would store spent nuclear fuel containing metallic sodium. This EIS assumes that the presence of metallic sodium in the sodium-bonded spent nuclear fuel may raise issues of acceptability in a repository and proposes technologies to either remove it or convert it into a nonreactive form to facilitate its disposal.

52-6: Since spent fuel degradation in storage cannot be ruled out, as described in Section 4.2.1 of the SBSNF EIS, air emissions under the No Action Alternative in the draft EIS were estimated using the adjusted values given

Commentor No. 52: Edwin Lyman (Cont'd)

Perhaps the most obvious one is the result (Table S-4) that the radiation dose to the public associated with the No Action alternative (SBSNF storage for 35 years) is nearly a factor of ten greater than that associated with Alternative 1 (EMT of the entire SBSNF inventory), although common sense dictates that the radioactive emissions resulting from processing SBSNF will exceed those resulting from storage. This curious result is a consequence of using an inconsistent set of assumptions for the two cases. At the public hearing in Arlington in August, DOE representatives assured the audience that this error would be remedied in the final EIS.

52-6 (Cont'd)

Another inconsistency is related to the categorization of the uranium recovered from the EMT process. The DEIS refuses to treat this material as a "waste," which is reflected in the tables listing the waste volumes resulting from the different alternatives. However, in the associated cost study, no credit is assigned to the recovered uranium. This is consistent with the expectation that this material will be "off-spec" and, moreover, that DOE has committed to tight restrictions on the sale of its surplus uranium for at least ten years in order to support the price of uranium originating from downblending of Russian HEU. However, a material without any value can properly be considered a waste and should be treated as such consistently through the documentation.

52-7

Comments on the *Nonproliferation Impacts Assessment for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel*

We are disappointed that DOE did not grant our request that the nonproliferation assessment for SBSNF treatment be provided to the public in draft form for comment as part of the EIS process. This is unfortunate, because the *Nonproliferation Impacts Assessment for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel* (NIA) provides only the most cursory and superficial examination of the important security issues associated with this action. As a result, the document in its current form sheds no new light on the situation and merely serves as a non-proliferation rubber-stamp.

52-8

1. The proliferation implications of other proposed applications of EMT must be considered.

Perhaps the most fundamental problem with the NIA is its refusal to look beyond the narrow constraints of the proposed program and consider the larger nonproliferation consequences of a decision by DOE to continue to pour resources into EMT development. While the NIA insists that "the Department has no current plan to use [EMT] ... beyond the potential treatment of the sodium-bonded spent nuclear fuel inventory," the authors are either dissembling or badly misinformed. One need go no further than the ANL-West World-Wide Web site page on EMT (http://www.era.anl.gov/spentfuel/emt.html) to discover that "the [EMT] process is being developed for application **to all constituents** of the DOE-owned spent nuclear fuel inventory" (emphasis ours).

52-9

Even worse, the NIA does not acknowledge the critical role played by EMT in DOE's

3

Response to Commentor No. 52 (Cont'd):

in the No Action Alternative for the Programmatic Spent Nuclear Fuel EIS. The adjustment was based on the ratio of the heavy mass inventory of the sodium-bonded spent nuclear fuel (60 metric tons) to the entire spent nuclear fuel inventory (274 metric tons) at INEEL. DOE assumed this estimate bounds any future degradation of the sodium-bonded spent nuclear fuel during storage at the INEEL site. The consequences resulting from this estimate were very small, and there was no intention to mislead the public. Since issuance of the SBSNF Draft EIS, DOE has modified the activities under both options of the No Action Alternative, as described in Section 4.2 of the final EIS; reevaluated the potential for sodium-bonded spent fuel degradation in wet and dry storage; and revised the estimates of air emissions and associated health effects. These new results are provided in the final EIS.

52-7: The uranium recovered from the electrometallurgical treatment process contains radioactive isotopes which render it unusable as surplus uranium without further processing to remove these impurities. DOE has not yet determined the final disposition of this uranium. For the purpose of the EIS, it is assumed that metal uranium ingots from the electrometallurgical treatment process would be stored in the Materials Building within the Zero Power Physics Reactor at ANL-W. The uranium recovered from the electrometallurgical treatment process has not been treated as a waste because of its potential value if it is further processed.

52-8: The SBSNF EIS has been prepared in accordance with NEPA, the Council on Environmental Quality regulations on implementing NEPA (40 FR 1500-1508), and DOE's NEPA implementation procedures (10 FR 1021). None of these require the preparation of a nonproliferation impacts assessment as part of the EIS process. As discussed in the introduction, the basic objective of this EIS is to provide the public and DOE decision-makers with a description of the reasonable alternatives for the treatment and management of DOE's sodium-bonded spent nuclear fuel and their potential environmental impact. DOE's Office of Arms Control and Nonproliferation separately assessed the potential nonproliferation impacts that may result from each of the alternatives and technologies analyzed in this EIS. The report stated that for this specific application all alternatives, except PUREX processing at SRS, are fully consistent with U.S. policy with respect to reprocessing and nonproliferation. DOE feels that this assessment provides the public with a reasonable comprehensive evaluation of the proliferation risks associated with each alternative. The information contained in the EIS, public

Commentor No. 52: Edwin Lyman (Cont'd)

"Roadmap for Accelerator Transmutation of Waste (ATW). ATW is a profoundly misguided and dangerous effort, spearheaded by Senator Pete Domenici of New Mexico, to jump-start commercial spent fuel reprocessing in the United States with massive government subsidies. Although this program is clearly in violation of U.S. government policy on reprocessing, "it appears likely an ATW program will be established within the DOE in the near future, most probably under the auspices of the Office of Nuclear Energy," according to the ATW program manager, Greg Van Tuyle.[1]

According to Van Tuyle, "ATW separations are based on variations on the pyrometallurgical processing developed in support of the Integral Fast Reactor program," i.e. on EMT. Therefore, any meaningful assessment of the nonproliferation impacts of EMT development must contain an analysis of its function within the ATW plan, as well as the ramifications of ATW in an international policy context.

Specifically, the NIA should examine whether DOE's attempt to sanitize EMT from a non-proliferation perspective has led to the current confusion that has allowed ATW to go forward. Supporters of ATW only need to invoke DOE's numerous statements that EMT is a proliferation-resistant technology to defend their plan and argue that it does not violate the U.S. non-reprocessing policy. Meanwhile, there has been no analysis to show that a credible and cost-effective safeguards regime could be implemented on an ATW system based on EMT, or that EMT's purported proliferation-resistance would be meaningful in such a context.

It also should be noted that the current ATW strategy involves use of an aqueous process known as "UREX" to separate uranium from commercial oxide spent fuel prior to EMT processing.[2] Therefore, EMT process lines would be co-located with aqueous process lines. Since the NIA insists that EMT does not pose proliferation risks unless there is an aqueous separations capability nearby that could be used for further plutonium purification, the ATW strategy should raise serious concerns even according to the NIA's logic.

The refusal of DOE to produce a realistic and honest assessment of the proliferation concerns associated with EMT will have clear ramifications. A quixotic campaign to develop a massive ATW infrastructure in the U.S. will breath new life into faltering reprocessing industries all over the world. The alleged proliferation resistance of EMT will provide a fig leaf for countries like Japan, who are repeatedly faced with suspicions by their neighbors concerning their accumulation of plutonium in civil programs.

52-9 (Cont'd)

[1] Greg Van Tuyle, "The Roadmap for Accelerator Transmutation of Waste," *Nuclear Weapons and Materials Monitor* 3 (22), September 27, 1999, p.10.

[2] Greg van Tuyle, *op cit.*

4

Response to Commentor No. 52 (Cont'd):

comments in response to the draft EIS, and the Nonproliferation Impacts Assessment will be among the factors considered during the decision-making process in preparing the Record of Decision.

52-9: This Nonproliferation Impacts Assessment analyzes the potential proliferation risks of all the alternatives presented in this EIS. Prepared by DOE's Office of Arms Control and Nonproliferation, the assessment concluded that for this specific application the electrometallurgical treatment process is fully consistent with U.S. policy with respect to reprocessing and nonproliferation. In the assessment, DOE acknowledges that future actions associated with the treatment and management of the sodium-bonded spent nuclear fuel should be closely scrutinized to evaluate their consistency with their individual and cumulative impact on U.S. policy concerning reprocessing and nonproliferation. While the commentor's concern about the proliferation implications of other proposed applications of electrometallurgical treatment is noted, these issues are beyond the scope of the SBSNF EIS.

52-10: There are several features of the electrometallurgical treatment process that make it adaptable to international safeguards. The process cell, made inaccessible to humans by high radiation, inert atmosphere, and thick concrete walls, has a minimal number of penetrations through which materials can be moved in and out. These openings are secured and can be readily monitored for material transfers. There are no liquid waste streams through which materials can be piped out of the facility. All by-products and waste from the process are in solid form, and thus are accountable by unit inventory. Finally, all materials moving out of the facility could be subjected to nondestructive examination if additional assurances were required under international safeguards agreements.

52-11: Although the assessment of nonproliferation impacts is not a part of the scope of the EIS, it should be noted that the residual highly enriched uranium in the cladding hulls can be determined accurately by several independent techniques. As much as 4 percent of the high enriched uranium in the EBR-II driver fuel may be left in the hulls to be disposed of as waste. Less than 1 percent of the depleted uranium would be left in the blanket fuel hulls because of different process conditions. Because the plutonium is preferentially dissolved from the blanket elements, no significant quantity of fissile material would remain in the blanket hulls. The blanket and driver hulls would be blended to reduce the enrichment of the residual uranium. Whether it would be desirable to blend a small amount of additional depleted

Commentor No. 52: Edwin Lyman (Cont'd)

2. A more detailed technical analysis of safeguard issues is essential.

The NIA glosses over many significant details. One crucial issue is the ability to apply accurate material accountancy techniques, both for domestic and international safeguards purposes. A highly inhomogeneous process such as EMT, with several different hard-to-characterize waste streams, will present significant challenges for material accountancy. While the NIA acknowledges that safeguards concepts for the complex bulk processing steps involved in EMT have not been demonstrated in detail, it asserts that effective international monitoring should be possible for a reasonable cost. However, it provides little justification for this assertion. **52-10**

On the other hand, the NIA states that after EMT of SBSNF, "less than five percent of the uranium [remains] undissolved in the cladding hulls" (according to the National Academy of Sciences, material balances are about 95% for blanket assemblies and about 98% for driver assemblies). This is actually quite poor performance from a material accountancy perspective. For instance, over 3 MTHM of HEU is contained in the EBR-II driver fuel. Two percent left in the hulls equals over 60 kilograms of HEU (about two significant quantities). It is unclear how accurately the residual HEU content in the cladding can or will be measured. In addition, five percent of the 250 kilograms of "super-grade" plutonium in the blanket fuel left in the hulls exceeds 12 kilograms. The NIA does not explore the implications of these results for material accountancy. **52-11**

The NIA also repeats without question the assertion that "pyroprocessing technology as envisioned in the IFR flowsheet is not capable of separating weapons-usable plutonium" because of the presence of uranium, radioactive fission products and minor actinides. This statement needs to be reevaluated in the current context for a number of reasons. First of all, as the current EMT demonstration project shows, over 95% of the uranium can be extracted on a steel cathode before extraction of the plutonium on a liquid cadmium cathode is attempted. Second, this author has shown that the residual fission products that remain with the plutonium after extraction provide a minimal radiation barrier, especially if the spent fuel has been out of the reactor for several months.[3] Third, the recently declassified statement by DOE that there are proliferation concerns associated with minor actinides, including Np-237 and Am-241, suggests that the cathode product may in fact have a greater utility for weapons than has previously been acknowledged, even without further purification. **52-12** **52-13**

The NIA also gives too much credit to the proliferation resistance of the EMT ceramic waste forms in concluding that there is a higher level of difficulty in recovering plutonium from them than from the original spent fuel elements. It is unclear why this is the case, since its analysis indicates that the radiation barrier provided by the waste forms will be no stronger than **52-14**

[3] Lyman, E.S., "Interim Storage Matrices for Excess Plutonium: Approaching the 'Spent Fuel Standard' Without the Use of Reactors," PU/CEES Report No. 286, Center for Energy and Environmental Studies, Princeton, NJ, August 1994.

Response to Commentor No. 52 (Cont'd):

uranium in the metal waste in order to meet safeguards and waste disposal goals is still under evaluation as a part of Argonne's continuing waste form development program.

52-12: The commentor makes reference to the Integral Fast Reactor program. The purpose for the Integral Fast Reactor program was to develop an efficient, safe process for recycling nuclear fuel by using a liquid metal-cooled reactor in combination with an integral fuel reprocessing facility. As part of this program, the EBR-II was used for fuel-design and fuel irradiation testing. Congress cancelled funding for the Integral Fast Reactor program in 1994. The previously envisioned Integral Fast Reactor process is outside the scope of the EIS. The Nonproliferation Impacts Analysis states that the pyroprocessing technology as envisioned in the Integral Fast Reactor program is not capable of separating weapons-usable plutonium was based both on previous evaluations and the more recent results obtained from the electrometallurgical treatment demonstration project. The current demonstration has actually shown that greater than 99 percent of the uranium is dissolved from the blanket elements and an equal amount is deposited on the cathode prior to being scraped into a product collection container. However, in order for this process to work, the uranium concentration in the electrolyte must be maintained within a specified range. Uranium chloride is added in order to maintain the concentration of uranium in the electrolyte at a constant level through the fuel treatment campaign. There is no cadmium cathode nor is there a state of operations in which 95 percent of the uranium would be removed from the electrolyte. The unsuitability of the plutonium product from the modified Integral Fast Reactor program for weapons use is based on several physical characteristics in addition to its high radiation barrier.

52-13: The evaluation performed considered the entire mix of materials in the hypothetical cathode, including neptunium and americium. The quantities of neptunium 237 and americium 241 in the EBR-II blanket elements are quite small, and could not change the conclusions even if their consideration had been omitted from the evaluation.

52-14: Given sufficient time and resources, any chemical element can be separated from another. Alternative 3, PUREX processing at SRS, for example, is a fully developed process that has equipment and facilities that are capable

Commentor No. 52: Edwin Lyman (Cont'd):

that provided by the original spent fuel (in fact, according to the NIA the radiation barriers are exactly the same before and after processing the EBR-II fuel). No evidence is presented to support the assertion that recovery of plutonium from the ceramic waste form would be decisively more difficult than from the spent fuel elements.

52-14 (Cont'd)

In summary, the NIA's conclusion that EMT of SBSNF is consistent with U.S. policy on plutonium reprocessing is short-sighted and ignores the vastly expanded uses of EMT that are being considered by DOE. The worldwide ramifications of continued EMT development are far more serious and damaging to U.S. nonproliferation efforts worldwide than the NIA acknowledges.

Sincerely,

Edwin S. Lyman, PhD
Scientific Director

Response to Commentor No. 52 (Cont'd):

of separating plutonium from the blanket fuel elements. The recovered plutonium from this process, however, is addressed by the Surplus Plutonium Disposition EIS. For the complex chemistry of the electrometallurgical treatment ceramic waste form, processes, equipment and facilities would have to be developed to recover plutonium. Therefore, it is reasonable to conclude that plutonium recovery from this ceramic waste form would be more difficult than recovering plutonium from the sodium-bonded spent nuclear fuel and melt and dilute product.

Commentor No. 53: Richard Parkin

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 Sixth Avenue
Seattle, Washington 98101

September 28, 1999

Reply To
Attn Of: ECO-088 Ref: 99-010-DOE

Sue Lesica
Office of Nuclear Facilities Management (NE-40)
Office of Nuclear Energy, Science, and Technology
U.S. Department of Energy
19901 Germantown Road
Germantown, MD 20874

Dear Ms. Lesica:

The Environmental Protection Agency has received and reviewed the draft Environmental Impact Statement (EIS) for the *Treatment and Management of Sodium-Bonded Spent Nuclear Fuel* consistent with our responsibilities under the National Environmental Policy Act and §309 of the Clean Air Act. The draft EIS examines six action alternatives to treat, contain, or treat and contain sodium-bonded spent nuclear fuel to facilitate its disposal in a geologic repository. The draft EIS does not identify a preferred alternative.

Based on our review, we have rated the draft EIS EC-2 (Environmental Concerns - Insufficient Information). This rating and a summary of our comments will be published in the *Federal Register*. We have enclosed a summary of the rating system used in our review for your reference.

It appears that the current drivers for this project are potential NRC regulations and the possibly inadequate current storage of spent nuclear fuels in high-integrity cans. However, the regulations remain unpromulgated and the viability of current storage of the spent fuels is not discussed in the EIS. Thus, the EIS fails to make a compelling argument that the proposed project is needed at this time. Moreover, the EIS was issued before final test results on the electrometallurgical process became available. This process is included in five of the six action alternatives. The absence of this information in the EIS prevents reviewers from fully assessing the efficacy of the the project.

Enclosed please find our detailed comments. We are interested in working closely with the Department of Energy in the resolution of these issues and I encourage you to contact Chris Gebhardt at (206) 553-0253 to discuss our comments and how they might best be addressed. Thank you for the opportunity to review this draft EIS.

Sincerely,

Richard B. Parkin

Richard B. Parkin, Manager
Geographic Implementation Unit

Printed on Recycled Paper

Response to Commentor No. 53:

Environmental Protection Agency Comments on the Draft Environmental Impact Statement (EIS) for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel

Introduction

The Environmental Protection Agency (EPA) has completed its review of the draft EIS for the *Treatment and Management of Sodium-Bonded Spent Nuclear Fuel*. We are primarily concerned about the lack of information in the following areas. The EIS does not explain why immediate treatment is necessary. It would appear that treatment at this time might be premature since the NRC (Nuclear Regulatory Commission) has not yet promulgated regulations and a disposal site has not been chosen. Moreover, the need to replace the high-integrity cans has not been demonstrated. Finally, results of final testing of the electrometallurgical process that demonstrates the cost-and treatment-effectiveness of this method are not available in the EIS.

Purpose and Need

The EIS fails to make a compelling argument that the proposed project is needed. The EIS should describe in more concrete terms the conditions creating a need to treat sodium-bonded spent nuclear fuels. Disclosure of this nature would better meet NEPA's requirement of presenting accurate, high-quality information for public scrutiny (40 CFR 1500.1(b)).

Lack of Critical Information Establishing and Defining a Need

The EIS has identified a need to treat sodium-bonded spent nuclear fuels before sufficient information exists to demonstrate this. The EIS states that storage regulations could require treatment of these spent fuels and examines options to treat the fuels before the regulatory parameters defining the existence and the nature of this need have been established:

- the site decision as to whether to store the spent fuels over the long term, and if so, where (e.g., Yucca Mountain) has not yet been made;
- the Nuclear Regulatory Commission (NRC) has not yet promulgated regulations for the safe storage of spent fuels, nor authorized construction, for the still undecided site;
- it is unknown whether blanket fuels (which comprise 95% of the total spent fuels by weight) would be in compliance with the requirements of RCRA (Resource Conservation and Recovery Act) and NRC if stored in high-integrity cans after sodium removal; and
- DOE has not tested whether high-integrity cans can viably and safely store metallic uranium for the projected 100,000 years needed.

Presumably, site characteristics, general and site-specific regulations and the capabilities of waste storage equipment dictate acceptable waste standards and appropriate treatments to meet standards. This critical information should be developed before a decision on whether and how to treat spent nuclear fuels is made.

1

53-1

53-1: DOE's examination of options for the management and treatment of sodium-bonded spent nuclear fuel is based on the existing regulatory environment concerning long-term disposal of spent nuclear fuel and high-level radioactive waste. It is also based on the assumption that sodium-bonded spent nuclear fuel, as well as other DOE-owned spent nuclear fuel, would eventually be disposed of in a geologic repository, whether at Yucca Mountain or some other site. As stated in Section 1.2 of the EIS, DOE needs to reduce the uncertainties associated with qualifying sodium-bonded spent nuclear fuel for disposal so that the requirements of the State of Idaho Settlement Agreement and Consent Order are met, and disposal in a geologic repository is facilitated.

The Settlement Agreement calls for removal of all spent nuclear fuel from the State of Idaho by the year 2035. It would be environmentally prudent for the fuel at the time of removal to be in a form that is suitable for repository disposal, even if it is transported for continued storage to another site outside the State of Idaho.

The uncertainties associated with qualifying sodium-bonded spent nuclear fuel for repository disposal are based on the existing regulatory environment. As discussed in Section 4.12.1 of the EIS, one of the key U.S. Nuclear Regulatory Commission requirements for acceptance of spent nuclear fuel or high-level radioactive waste is that it cannot contain or generate materials that are explosive, pyrophoric, or chemically reactive (in a repository environment) in a form or amount that could compromise the repository's ability to perform its waste isolation function or to satisfy its performance objective (10 CFR 135(b)(1)). In addition, in accordance with the current version of the "Waste Acceptance Systems Requirements Document," issued in April 1999 by the DOE Office of Civilian Radioactive Waste Management, only spent nuclear fuel and high-level radioactive waste that is not subject to regulation under RCRA, Subtitle C, and meets all other acceptance criteria (e.g., packaging, uranium content), will be accepted for disposal. Although this determination for sodium-bonded spent nuclear fuel has not been made, it is a possible outcome. Based on the current regulatory environment, it is highly probable that sodium-bonded spent nuclear fuel will not be qualified for repository disposal without the removal or conversion of the metallic sodium to a nonreactive form.

The timing for this action is a programmatic issue rather than a safety issue. That is, the driver for the project is not "inadequate storage of spent nuclear fuel in high integrity cans," as the commentor appears to have concluded from the EIS. The EIS does not make this statement.

Commentor No. 53: Richard Parkin (Cont'd)

No Need for Immediate Action

The information in the EIS does not demonstrate an urgent need to treat the spent nuclear fuels. The consent agreement between the State of Idaho and Department of Energy (DOE)/Navy specifies a time frame ending in the Year 2035 for removing the sodium-bonded spent nuclear fuels from Idaho. Presently, DOE is safely storing these spent fuels in high-integrity cans. Continuing to do so in Idaho for the short-term and other locations (e.g., Yucca Mountain) over the long-term does not appear problematic from the information presented in the EIS.

Insufficient Information about Electrometallurgical Treatment

The EIS calls for using electrometallurgical treatment in five of the six action alternatives. Nevertheless, the draft EIS was issued before final testing of the treatment- and cost-effectiveness of the electrometallurgical process were conducted. The results of these tests are absent from the draft EIS, and thus largely from public review and scrutiny.

Conclusion

We believe it critical that the draft EIS include the final tests results for the electrometallurgical process as well as information indicating the need for the project to achieve the dual purposes of NEPA: public disclosure and involvement and better decisions. Therefore, we suggest that you consider including the following information.

- the location of the geologic repository for the sodium-bonded, spent nuclear fuels,
- an explanation of the RCRA, AEA (Atomic Energy Act) and NRC standards that must be met for safe storage at the designated geologic repository,
- a description of the viability of high-integrity cans for the long-term storage of metallic uranium, and
- the test results of the cost- and treatment-effectiveness of the electrometallurgical process.

More Detailed Comments

Page S-3
Sidebars on this and other pages present background information in an appealing, useful way.

Page S-34:
In the last paragraph, the risk estimates should be "0.0088" vs. "0.0088 x 10-4".

Section 4.4.4.1:
It should be noted somewhere in the evaluation that with regard to the EPA requirements for radioactive air emissions under 40 CFR 61, levels below the 10 mrem/year standard are acceptable and that lower levels are not necessarily "more acceptable".

53-1 (Cont'd)

53-2

53-3

53-4

2

Response to Commentor No. 53 (Cont'd):

Furthermore, the EIS does not assume that the sodium-bonded spent nuclear fuel is currently stored in high integrity cans. As stated in Section 1.2 of the EIS, DOE considers it prudent to evaluate the alternative technologies now, while DOE is performing site characterization activities for the potential repository at Yucca Mountain. Potential waste forms resulting from treatment or packaging of sodium-bonded spent nuclear fuel should be developed as much as possible in parallel with any repository development to promote consistency between the two efforts and to minimize the programmatic risks associated with waste qualification and acceptance for ultimate disposal. In addition, as discussed in Section 1.6.3 of the EIS, the Electrometallurgical Treatment Research and Demonstration Project was recently completed, successfully fulfilling all the criteria established at the outset of the project. In view of the results, DOE needs to decide whether electrometallurgical treatment is a viable technology for processing the rest of the sodium-bonded spent nuclear fuel, or whether some other process could offer environmental, cost, or nonproliferation advantages. Should DOE decide that electrometallurgical treatment is the appropriate treatment technology, the decision needs to be made while the facilities, skills, and personnel involved in the demonstration project are still available to carry out the treatment in an expedient and cost-effective manner. Section 1.2 of the EIS has been revised for clarification.

Final test results were made available in August 1999 and were used in preparing the EIS. The success criteria established at the outset of the project have been fulfilled. The environmental impact analysis associated with the electrometallurgical treatment process alternatives was based on actual data from the project. Section 1.6.3 of the EIS summarizes the current status and the results of the project.

DOE expects that spent nuclear fuel eventually will be disposed of in a geologic repository and this is a fundamental assumption made in the EIS. The site-specific characteristics of the potential repository are not expected to alter the uncertainties associated with qualifying sodium-bonded spent nuclear fuel for disposal. But even if one assumes that spent nuclear fuel will not be stored for the long term in a geologic repository, the treatment and management of this small quantity of spent nuclear fuel (2 percent of the total spent nuclear fuel inventory owned by DOE) to convert it to a stable, nonreactive form would be beneficial in any long-term storage environment. The high-integrity cans identified in the EIS protect the spent nuclear fuel while it is stored at the site until placement in standardized canisters for transportation to the repository. They would also provide

Commentor No. 53: Richard Parkin (Cont'd)

Section 4.4.4.2:
If accidents are screened based on frequency (i.e., less than 1E-7), consideration should also be given to screening based on consequence (i.e., dose level). **53-5**

Page 4-30:
The justification for excluding analysis of criticality accidents does not address the fact that although the frequency may be low, the dose consequences are likely greater than any other accident. This coupled with the understanding that a number of criticality accidents have occurred (including at INEEL), and the highly enriched nature of some of the uranium, would indicate the need for further evaluation. In addition, the issue of criticality is specifically mentioned in section S.1.1 with regard to geologic repository concerns so it seems inconsistent to exclude it from evaluation. **53-6**

Page E-6, Radiation Protection Guides:
This section should include the EPA Radiation Protection Guidance to Federal Agencies for both occupational radiation exposure and exposure to the general public. **53-7**

Page E-6, Limits of Radiation Exposure:
This section is misleading about the process and basis for radiation standards set by Federal agencies. ICRP and NCRP make recommendations. EPA takes those recommendations into account when issuing guidance (Radiation Protection Guidance for Federal Agencies). Federal agencies (including DOE) follow EPA Guidance in setting radiation standards under their own specific authority.

This section should include discussion of the EPA Radiation Protection Guidance to Federal Agencies for both occupational radiation exposure and exposure to the general public. These Guidance documents provide the basis for the implementation of radiation protection levels by other federal agencies (including DOE) under their own specific authorities. **53-8**

This section should also include NCRP as a source of recommendations in addition to the ICRP.

Table E-1:

The proper "guidance criterion" associated with 4 mrem/year (drinking water) is the EPA drinking water standards referred to at 40 CFR 141.

This table should make it clear where exposure standards include an "ALARA" requirement and where they do not. For instance, the 5000 mrem/year and 2000 mrem/year worker exposure limits also require that exposures be maintained "as low as reasonably achievable". By contrast, the 40 CFR 190 and 40 CFR 61 standards are compliance criteria that do not require any additional effort to reduce exposures. **53-9**

3

Response to Commentor No. 53 (Cont'd):

another barrier for protection in a repository environment; however, the barrier relied on to provide the isolation function at the repository is the waste package that would contain the standardized canisters which, in turn, would contain the high-integrity cans. In the environmental impact analysis, the Yucca Mountain Draft EIS takes no credit for the long-term integrity of either the standardized canisters or the cans (e.g., the high-integrity cans mentioned in this SBSNF EIS). Section 2.3.3 of the EIS has been revised to clarify the function of the high-integrity cans.

In the absence of metallic sodium, the other constituent of sodium-bonded spent nuclear fuel that is described as reactive and, in some cases, pyrophoric is metallic uranium. As discussed in Section 4.12.1, metallic uranium is defined under the Atomic Energy Act of 1954, as amended (42 U.S.C. 2001 et seq.), as a source, special nuclear, or by-product material and, therefore, is excluded from RCRA under 40 CFR 261.4(a)4. Furthermore, the purpose of the proposed action is to reduce the uncertainties associated with qualifying sodium-bonded spent nuclear fuel for repository disposal.

53-2: DOE acknowledges the commentor's recognition of the usefulness of the information presented in the sidebar format.

53-3: The commentor is correct; the risk estimate in the draft EIS should have been 0.0088.

53-4: DOE agrees with the commentor, and a clarifying statement has been added to Section E.2.1 of Appendix E, Limits on Radiation Exposure, in the EIS. This information had been addressed in Section 4.1.3.

53-5: To meet the Council of Environmental Quality's regulations, DOE's Office of NEPA Oversight has issued recommendations for the preparation of environmental assessments and environmental impact statements. In accordance with this guidance the analysis should identify a spectrum of the potential accident scenarios that could occur. The accident frequency should be "reasonably foreseeable." The primary purpose of accident analysis would be twofold: (1) to determine whether a proposed action has a potential for significant impact, and (2) to inform an agency (and the public) in making reasonable choices among alternatives. The accidents would have a likelihood of occurrence of greater than 10^{-7} per year. The guidance indicates that events with a probability of less than 10^{-7} will rarely need to be evaluated. Therefore, screening based on the frequency eliminates the need to evaluate the consequences.

Commentor No. 53: Richard Parkin

Response to Commentor No. 53 (Cont'd):

53-6: The potential for criticality could only exist if sufficient fissile material (enriched uranium fuel) existed in a favorable critical geometry. Operation of the hot cell facilities at ANL-W limits any moderator within the hot cell. The analysis of criticality accidents described in Section F.2.2.1.2 of Appendix F evaluated the potential for a criticality accident after a beyond design-basis earthquake, considering equipment operation at capacity and nuclear fuel staged for treatment, and concluded the likelihood of such an accident to be less than 10^{-7} per year. DOE evaluated an accidental criticality for melt and dilute processing of driver spent nuclear fuel. The consequences of such an accident are described in Appendix F and are summarized in Chapter 4 of the EIS. As indicated, the consequences to both the public and workers from a criticality accident in operations performed in the hot cells are very small. Once the fuel is put in a geologic repository, water could be available to potentially create a critical condition; therefore, criticality safety considerations would need to be implemented.

53-7: This section has been revised and clarifying statements have been added.

53-8: Clarifying statements have been added to Section E.2.1, of this EIS.

53-9: Clarifying statements have been added to Section E.2.1, of this EIS.

Commentor No. 54: Barbara Mathison

1335 Sew Creek Way
Meridian, Idaho,
83642
Sept. 9, 1999

Dear Ms. Susan Lewis,

I am commenting on the "Draft Environmental Impact Statement for the Treatment and Management of Sodium-Bonded Spent Nuclear Fuel"

I object to the Proposed Project at INEEL to Cyropro-cessing spent nuclear waste. 54-1

This procedure separates out bomb-grade uranium from spent fuel and therefore runs counter to U.S. Nonproliferation goals. In addition, the technology can be modified to separate out bomb-grade plutonium. 54-2

The project creates new forms of nuclear waste. It 54-3

54-4

Response to Commentor No. 54:

54-1: The commentor's objection to electrometallurgical treatment (pyroprocessing) of the sodium-bonded spent nuclear fuel at INEEL is noted.

54-2: The assessment of nonproliferation impacts is not a part of the scope of the EIS. However, none of the alternatives analyzed in this EIS would generate weapons-usable fissile materials at INEEL. Although highly enriched uranium is an interim product, it is downblended to low enriched uranium during electrometallurgical treatment (pyroprocessing). Within the current equipment configuration and design, it is not possible to produce weapons-usable plutonium by adjusting operating parameters. Traditional aqueous processing would have to be used after electrometallurgical treatment. However, traditional aqueous processing could also be used to produce weapons-usable plutonium directly from the spent nuclear fuel, without pyroprocessing.

54-3: All of the alternatives evaluated in this EIS would produce some forms of high-level radioactive waste. Electrometallurgical treatment (pyroprocessing) would produce two new waste forms, both of which are more stable than untreated sodium-bonded spent nuclear fuel. DOE expects these waste forms would be suitable for disposal in a geologic repository.

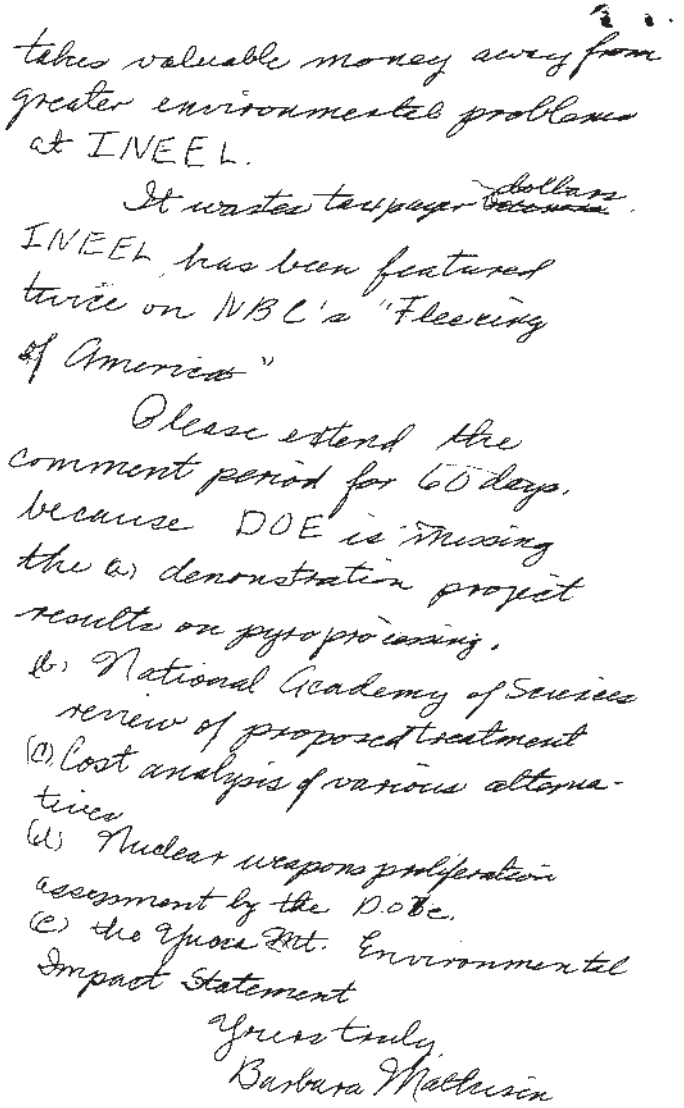
54-4: Congress determines how funds are allocated. DOE spends monies consistent with congressional direction. DOE is not in a position to make the difficult tradeoffs that may be required between alternative Federal programs and spending priorities. The issue of funding for the treatment and management of sodium-bonded spent nuclear fuel is beyond the scope of the SBSNF EIS.

54-5: In an effort to ensure that all interested parties had time to comment on the draft EIS, the deadline for transmittal of comments was extended from September 13, 1999, to September 28, 1999 (64 FR 49169).

54-6: Final test results were made available in August 1999 and were used in the EIS. The success criteria established at the outset of the project were fulfilled. The environmental impact analysis associated with the electrometallurgical process alternatives was based on actual data from the project. Section 1.6.3 of the EIS summarizes the status and the results of the project.

54-7: The National Academy of Sciences' National Research Council Committee prepared interim status reports on the results of the Electrometallurgical Treatment Research and Demonstration Project that have been reviewed

Commentor No. 54: Barbara Mathison (Cont'd)



takes valuable money away from greater environmental problems at INEEL.

It wastes taxpayer dollars because.

INEEL has been featured twice on NBC's "Fleecing of America"

Please extend the comment period for 60 days. because DOE is missing the (a) demonstration project results on pyroprocessing.

(b) National Academy of Sciences review of proposed treatment

(c) Cost analysis of various alternatives

(d) Nuclear weapons proliferation assessment by the D.o.E.

(e) the Yucca Mt. Environmental Impact Statement

Yours truly,
Barbara Mathison

54-4 (Cont'd)

54-5

54-6

54-7

54-8

54-9

54-10

Response to Commentor No. 54 (Cont'd):

by DOE. The National Research Council completed their evaluation of the electrometallurgical treatment demonstration project in September 1999 and published their final summary report in April 2000. The final report findings will be considered during the decision-making process leading to the Record of Decision.

54-8: Environmental impact statements do not normally include a cost comparison between alternatives as costs are not environmental consequences. At the request of several members of the public during the Scoping Process for this draft EIS, DOE made a separate Cost Study available to the public during the comment period for the draft EIS. Copies of the Cost Study were mailed to individuals requesting the study, and copies were available during the four public hearings on the draft EIS.

54-9: Although the assessment of nonproliferation impacts is not a part of the EIS process, DOE's Nonproliferation Impacts Assessment was mailed out to interested members of the public on August 12, 1999 and is available by request. The assessment was also placed in DOE public reading rooms and distributed at public hearings during the public comment period on the draft EIS. Information from the assessment, along with other factors such as cost, schedule, environmental consequences, and technical risk will be considered during the decision-making process in preparing the Record of Decision.

54-10: The EIS has not specified a site for ultimate geologic disposal of waste, and thus is not affected by site-specific information that may be contained in the Yucca Mountain Draft EIS. As discussed in the revised Section 1.6.2.2 of this EIS, the Draft Yucca Mountain EIS was released by DOE in July 1999. Nothing contained in the Yucca Mountain Draft EIS changes the assumptions and the environmental impact analysis presented in the SBSNF EIS.

Commentor No. 55: Robert Bobo

The SHOSHONE-BANNOCK TRIBES

FORT HALL INDIAN RESERVATION
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September 17, 1999

Ms. Sue Lesica
US Department of Energy, NE-40
19901 Germantown Rd.
Germantown, MD 20874

Dear Ms. Lesica:

RE: *DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE TREATMENT AND MANAGEMENT OF SODIUM -BONDED SPENT NUCLEAR FUEL*

Attached are comments compiled by the technical departments of the Shoshone-Bannock Tribes. Thank you for the opportunity to review and comment on this document.

Sincerely,

Robert Bobo, Project Director

cc: Robert Fence, DOE-ID American Indian Program Manager
file

Response to Commentor No. 55:

Commentor No. 55: Robert Bobo (Cont'd)

COMMENTS TO THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE TREATMENT AND MANAGEMENT OF SODIUM-BONDED FUEL

(all comments refer to the summary document)

Pg. iii - Instead of just saying there is a 45-day comment period, give the exact dates and deadlines. Also clearly indicate who should be the recipient of the comments. — **55-1**

Pg. S-2- Inasmuch as 98% of DOE's sodium bonded fuel is located at INEEL, it would seem prudent to perform any treatment at INEEL rather than ship the fuel to SRS or other facility. Transportation of SNF should be kept to a minimum. — **55-2** **55-3**

Pg. S-2, sect S.1.1- One of the primary reasons given for treating sodium fuel is that "sodium reacts vigorously with water or moist air…" Why, then, is the sodium bonded fuel stored in water basins at INEEL and SRS? — **55-4**

Pg. S-13, sect S.3.1, 4th para. – What process is used to treat the uranium, and how will the uranium ingots be disposed? As waste or as a usable resource? — **55-5**

Pg. S-14, sect S.3.3, 1st para. - Please define "long-term". — **55-6**

Pg. S-14, sect S.3.3, last para. - Please expound further on "…designed to promote containment under repository conditions." What exactly would those containment criteria be? And what are the repository conditions? — **55-7**

Pg. S-14, sect S.3.4, 1st para. – It is this commentor's understanding that the only reason for treating sodium-bonded fuel is to remove the sodium; for disposal of SNF without sodium, no treatment will be necessary. If that is in fact the case, the first option of the Melt and Dilute Process seems unnecessary inasmuch as the sodium has already been removed (how?) before the remaining constituents are melted. If the sodium has already been removed, the mission has been accomplished, has it not? Dispose of the remaining constituents as non-sodium SNF that requires no treatment. Likewise, option two calls for treatment *after* the sodium has been removed. Again, if the sodium has already been removed, the goal set out in this EIS has been met. Why is it necessary to treat the remaining constituents? — **55-8**

Pg. S-15, sects S.3.5 and S.36, 1st para – Mention is made to research and development demonstration projects. What is the status of those projects? Have they demonstrated the feasibility of these two alternatives? — **55-9**

Pg. S-16, sect S.3.9, 1st para. – At the risk of belaboring the point, may I express perplexity in the statement, "For those methods that do not require the removal of metallic sodium prior to treatment…" Also, in the next paragraph, the statement "To remove the cladding after sodium has been extracted…" It seems totally superfluous to entertain any process for treatment *after* the sodium has been removed inasmuch as the removal of sodium is the sole reason given for treating the fuel to begin with. — **55-8**

Response to Commentor No. 55 (Cont'd):

55-1: The text cited by the commentor has been revised in the final EIS. In notices to the public published in the Federal Register, mailings to interested stakeholders, and in statements made by DOE at public meetings during the public scoping and comment periods members of the public were directed to submit comments to the DOE Document Manager, Ms. Susan Lesica.

55-2: The commentor's support for treating sodium-bonded spent nuclear fuel at INEEL, since most of it is located there, is noted. The environmental impacts from the transportation of blanket spent nuclear fuel from Idaho to SRS, discussed in Sections 4.9.4 and 4.9.6 of the EIS, are very small.

55-3: DOE assumes the commentor is referring to Alternatives 3 and 5, where the declad and cleaned (metallic sodium removed) blanket spent nuclear fuel would be transported to SRS for treatment. As explained in the EIS, the risks associated with fuel transport are very small. Regardless of the alternative, DOE would need to transport spent nuclear fuel and/or high-level waste out of INEEL. DOE will proceed in accordance with the DOE/Shoshone-Bannock Tribes Agreement-in-Principal, which covers notification and coordination of the transport of radioactive materials across the Fort Hall Reservation.

55-4: As discussed in Section E.4.6, the EBR-II fuel at INTEC's Basins 666 and 66 are stored inside sealed stainless steel cans that prevent the contact of basin water with the fuel cladding. During the average 17 years of storage in Basin 666, 10 of the 2,148 cans were confirmed to have water in-leakage. With water inside these cans, a fuel-water reaction produced hydrogen gas, which created bubbles that allowed detection of the water in-leakage. These observations are consistent with the fact that sodium and metallic uranium react with water to produce hydrogen and this is the reason that all the sodium-bonded spent nuclear fuel is stored in dry storage or sealed containers that prevent the exposure of the fuel cladding to water. The fuel at SRS is a single sodium-bonded spent nuclear fuel element encapsulated in an aluminum can, with no observed failure.

55-5: Two uranium stream products are produced by the electrometallurgical process. The uranium separated from the processed driver spent nuclear fuel would be diluted to about 19 percent uranium-235 (a low-enriched uranium fuel) before being cast into uranium ingots. Processing of the blanket spent nuclear fuel would produce depleted uranium ingots. As explained in Section 4.1.2 of the EIS, these products are not considered waste products. However, the uranium ingots would have fission product

and actinide contamination (in trace quantities) that would require additional purification before they could be used commercially. Disposition of this surplus uranium will be the subject of a future NEPA review.

55-6: DOE interprets "long-term" to mean 1000 or more years after the repository's closure and no institutional control. The text in Section S.3.3 has been revised for clarification.

55-7: Containment criteria and repository conditions are provided in the Yucca Mountain Draft EIS and 10 CFR Part 60. Section S.3.3 of the Summary to this EIS has been revised for clarification.

55-8: As stated in the introduction to the EIS, the programmatic risk associated with implementing any of the potential alternatives for the treatment and management of sodium-bonded spent nuclear fuel, or with not treating this fuel, is the uncertainty surrounding the acceptability of DOE spent nuclear fuel for placement in a potential geologic repository. While DOE has drafted preliminary waste acceptance criteria for a geologic repository, the final acceptance criteria will be more refined. If the repository is developed, final acceptance criteria will not be available until after the U.S. Nuclear Regulatory Commission issues its construction authorization, based on the successful demonstration of the safe, long-term performance of the repository in accordance with the U.S. Nuclear Regulatory Commission regulations. As discussed in Section 1.2, the presence of metallic sodium is the primary, but not sole, reason for the proposed action. The presence of metallic uranium or the presence of highly enriched uranium could also complicate the process of qualifying the spent nuclear fuel for disposal. Such qualification would require sufficient data and predictive analyses to demonstrate that emplacement of the spent nuclear fuel would not adversely affect a repository's ability to protect the environment and worker and public health and safety. To ensure that the requirements of the State of Idaho Settlement Agreement and Consent Order are met, and to facilitate disposal, DOE needs to reduce the uncertainties associated with qualifying sodium-bonded spent nuclear fuel for disposal. Appropriate treatment and management of the sodium-bonded spent nuclear fuel (e.g., PUREX processing) would significantly reduce complications related to disposal qualification . The borosilicate glass waste form resulting from PUREX processing has been extensively tested and analyzed under conditions relevant to a geologic repository. It is expected that other waste forms (e.g., ceramic and metallic) would be suitable for repository disposal.

Commentor No. 55: Robert Bobo

Response to Commentor No. 55: (Cont'd)

55-9: The text in the draft EIS, as written, could imply that demonstration projects for the GMODS and plasma arc-vitreous ceramic processes are ongoing. This is not the case. The text has been revised to indicate that these technologies have the potential for treating both blanket and driver sodium-bonded spent nuclear fuel if it is demonstrated that they can deal with sodium and other factors.

Commentor No. 56: John Commander and Lowell Jobe

COALITION21 Supporting Tomorrow's Technologies With Facts ✦ Not Fears!
P.O. Box 51232✦Idaho Falls, Idaho 83405✦208-528-2161✦FAX: 528-2199

COMMENTS FROM COALITION 21 RE DOE/EIS-0306D DRAFT EIS for
SODIUM-BONDED SPENT NUCLEAR FUEL

It was nearly impossible for the public to evaluate the alternatives prior to having the independent cost and non-proliferation reports. With these finally available August 26th.we now submit the following comments: **56-1**

1. Coalition 21 strongly supports the treatment of the sodium-bonded spent nuclear fuel (SBSNF) by the electrometallurgical process. The process should be used for both driver and blanket fuels. as described in Alternative 1 for the following reasons:

a. Since over 98% of the SBSNF is located at INEEL. it seems only reasonable that all of it be treated at ANL-W unless there was an overriding cost saving by using an alternative method.

b. ANL-W is the location of most of the experience and expertise in handling SBSNF materials.

c. The National Research Council in its most recent report expressed the opinion that. with the exception of the Purex process. all other alternatives to the electrometallurgical process were at an early stage of development. (Vol.1, p2-41). **56-2**

d. Since the amount of SBSNF appears to be a fixed amount with no planned future additions, there is no further justification for funding the development of any other alternatives to handle the current amount of SBSNF.

e. Alternative 1, properly done, will demonstrate to the government and the public that the remnants of the Integral Fast Reactor program have been made ready for final disposal. It will have been accomplished in a timely manner with a technology compatible with the IFR concept. This position is consistent with the objectives of our lawsuit against DOE, which asks the court to require DOE to do a complete EIS on the disposal of the rest of the EBR-II reactor.

f. This alternative will also dispose of the sodium-bonded fuel, so that it cannot be used as an example of a failed technology by anti-nuclear groups.

2. We recommend that the cost report be redone and reissued to assure consistency in reporting, especially units of data tables. For example, in the separate cost report, Tables S-1 and 2 give cost summaries in 'millions of year 2000 dollars', while Table S-3 uses 'thousands of 2000 dollars (tabulated in tens of thousands) instead of using consistent 'millions of dollars'. To further confuse comparison of figures, Tables F-2 and F-3 thru F-9 list values as 'current dollars' (again tabulated in tens of thousands); this required searching for a clue to the discrepancy, found only in the bullet 2 under the F-2 Summary re Alternative 3's cost figure: 'at more than $130 million in 2009'. **56-3**

Visit our internet site! www.coalition21.org Printed on Recycled Paper Send us E-mail! facts@coalition21.org

Response to Commentor No. 56 (Cont'd):

56-1: The preparation of the Cost Study and Nonproliferation Impacts Assessment was expedited so that they could be mailed to interested parties on August 12, 1999, and be available to attendees at all of the public hearings on the draft EIS. Although these reports are not required for the EIS, they will be considered during the decision-making process in the preparation of the Record of Decision.

56-2: The commentor's support for using the electrometallurgical process to treat both driver and blanket fuel at ANL-W is noted. DOE acknowledges that the reasons provided by the commentor concerning the current location of the sodium-bonded spent nuclear fuel and the maturity of the electrometallurgical process are valid and have been the subject of discussion in the EIS. Issues such as funding or public relations are not within the scope of the EIS.

56-3: DOE believes the Cost Study provides the public with a reasonable comprehensive estimate of the cost of each alternative. There is no need to revise the Cost Study, because costs for treating and managing sodium-bonded spent nuclear fuel are not part of the EIS process. However, cost will be one of the factors considered in preparing the Record of Decision for the treatment and management of sodium-bonded spent nuclear fuel.

56-4: The costs presented in Table F-2 were discounted by the official discount rate provided by the Office of Management and Budget (4.9 percent) in accordance with the methodology described in Section 1.4 of the Cost Study. The ANL-W costs in Tables F-3 through F-9 are larger because they were not discounted, as stated on the last line of each table. The purpose of Tables F-3 through F-9 is to show the nominal costs in the year that those costs would be incurred.

56-5: The commentors' acknowledgment of the ranking of the estimated cost of alternatives as presented in the Cost Study is noted. Factors such as cost, schedule, environmental consequences, and technical risk will factor into the Record of Decision for the treatment and management of sodium-bonded spent nuclear fuel.

56-6: Tables S-3 and F-2 of the Cost Study are not numerically identical because the data in Table S-3 are discounted to year 2000 dollars, whereas the data in Table F-2 are in nominal dollars in the year in which the costs are incurred. From 2001 through 2006, Alternative 1 has lower annual costs than the other alternatives. The higher costs projected for Alternatives 4, 5 and 6 are partially explained by higher contingency factors that have been added to reflect their lesser degree of technological maturity.

Commentor No. 56: John Commander and Lowell Jobe

Next, how can annual costs for 10 year summaries of data from Table F-2 be greater than the 35 year summaries of Table S-3 and the life cycle costs of alternatives 2,3 &4 of Table S-2?. Also, how can the annual ANL-W cost summaries from Tables F-3 thru F-9 be larger than ANL-W life cycle costs of Table S-2 except for the no-action and alternative 1? These inconsistencies need answering or correction. Any corrections might affect the other following comments. **56-4**

3. If cost were the only consideration, Alternative 2 for treating Driver-SNF and sodium removal plus packaging the blanket SNF in High-integrity cans at ANL-W would produces the lowest cost both by site and total cost, including waste disposal charges (Table S-2 of the cost report). Alternatives 1 and 3 were in second and third place, with Alternatives 4, 5 and 6 being substantially higher (Table S-2). **56-5**

4. The annualized cost tables S-3 and F-2, although not numerically identical, result in the same conclusions that would place Alternatives 4, 5, and 6 out of consideration, in line with their less mature status. Table F-2 also shows our recommended Alternative 1 for the electrometallurgical treatment of all SBSNF as the lowest 10 year annualized cost. **56-6**

5. Although the Purex treatment part of Alternative 3 produces the least amount of high level waste (HLW), it produces several times as much Transuranic (TRU) and low level waste (LLW) as any other alternative. **56-7**

6. The No-Action alternative produces more HLW than any of the other alternatives. With an attendant cost of 73-86% of those for Alternatives 1 through 3 for no measureable solution to the problem, any consideration of this would be unwarranted. **56-8**

7. Since only the blanket-SBSNF can be handled at SRS and it must be first decladded and cleaned of sodium at ANL-W, the only advantage of Alternative 3 would be the transferal of that part of the SNF out of Idaho. There is no net time saving except for the Purex processing. **56-9**

8. All alternatives still require ANL-W to treat the driver SNF. Alternative 5 would still requires ANL-W to declad and clean the blanket-SBSNF of sodium prior to packaging it for shipment to SRS. In order to meet the 1995 Nuclear Waste Agreement with the state of Idaho, SRS would have to guarantee they could receive the material as it was readied, regardless of their prior commitments for handling other materials until 2035. **56-10**

9. We agree with the conclusions of the separate nonproliferation report that "Of the seven alternatives proposed in the Draft EIS, only one-that involving Purex reprocessing at the Savannah River Site raises significant nonproliferation issues....The alternative involving Purex reprocessing at SRS involves operation of a former weapons production facility and production of weapons-usable material." We see no non-proliferation problem with the electrometallurgical process. **56-11**

10. We recommend that the final EIS not be delayed to allow public comments on the final report of the electrometallurgical project by the Nat.Research Council of the NAS, a nationally recognized non-partisan organization; public comment is not required for this. Its report will be factored into the final EIS and ROD. **56-12**

Lowell A. Jobe

John C. Commander

Response to Commentor No. 56 (Cont'd):

56-7: The estimated waste generated by each of the alternatives is given in Table 2-4 of the EIS.

56-8: As indicated in the waste management sections of Chapter 4 of the EIS and summarized in Table 2-4, the direct disposal option of the No Action Alternative results in the highest volume of material (spent nuclear fuel or high-level radioactive waste) that would be disposed of in a repository. The commentor's opinion that the No Action Alternative should not be considered because it does not reduce waste volumes and the cost is nearly that of Alternatives 1 through 3 is noted.

56-9: Time-saving is one of the programmatic issues; however, the programmatic risk in implementing any of the potential alternatives for the treatment and management of sodium-bonded spent nuclear fuel, or of not treating this fuel, is the uncertainty surrounding the acceptability of DOE's spent nuclear fuel for emplacement in a potential geologic repository. While DOE has drafted preliminary waste acceptance criteria for a geologic repository, the final acceptance criteria will be more refined. If the repository is developed, final acceptance criteria will not be available until after the U.S. Nuclear Regulatory Commission issues its construction authorization based on successful demonstration of the safe, long-term performance of the repository in accordance with the U.S. Nuclear Regulatory Commission regulations. As discussed in Section 1.2, the presence of metallic sodium is the primary but not the only reason for the proposed action. The presence of metallic uranium, or the presence of highly enriched uranium could also complicate the process of certifying the repository. Such certification would require sufficient data and predictive analyses to demonstrate that placement of the spent nuclear fuel would not adversely affect a repository's ability to protect the environment and worker and public health and safety. To ensure that requirements of the State of Idaho Settlement Agreement and Consent Order are met and to facilitate disposal, DOE needs to reduce the uncertainties associated with qualifying sodium-bonded spent nuclear fuel for disposal. Appropriate treatment and management of the sodium-bonded spent nuclear fuel (e.g., PUREX processing) would significantly reduce the complications related to disposal qualification. The borosilicate glass waste form resulting from PUREX processing has been extensively tested and anlyzed under conditions relevant to a geologic repository. It is expected that other waste forms (e.g., ceramic and metallic) would be suitable for repository disposal.

Commentor No. 56: John Commander and Lowell Jobe

Response to Commentor No. 56 (Cont'd):

56-10: DOE agrees with the commentor that SRS should be able to receive declad and cleaned blanket fuel on or before 2035 for melt and dilute processing as soon as current missions are completed (around 2035). However, as indicated in Section 4.12.2, treatment at SRS could start as early as 2020 if additional treatment capacity becomes available, which is a programmatic rather than environmental issue.

56-11: The commentors' agreement with the Nonproliferation Impacts Assessment is noted.

56-12: The public comment period was extended from September 13 to September 28, 1999 (64 FR 49169) so that all interested parties would have additional time to comment on the draft EIS. While the results of the demonstration project were used to prepare the EIS, DOE agrees with the commentor that public comments on the final National Research Council report on the Electrometallurgical Treatment Research and Demonstration Project at ANL-W are not required by NEPA. It should be noted that the National Academy of Sciences' National Research Council Committee's interim status reports on the demonstration project were made available to the public in the public reading rooms.